Calhoun: The NPS Institutional Archive

DSpace Repository

Theses and Dissertations 1. Thesis and Dissertation Collection, all items

1971

Planning and control systems in the current operations of institutions of higher education.

Schwartz, Peter A.

George Washington University

http://hdl.handle.net/10945/15855

Downloaded from NPS Archive: Calhoun

DUDLEY KNOX LIBRARY

Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

http://www.nps.edu/library

PLANNING AND CONTROL SYSTEMS IN THE CURRENT OPERATIONS OF INSTITUTIONS OF HIGHER EDUCATION

Peter A. Schwartz

PLANNING AND CONTROL SYSTEMS IN THE CURRENT OPERATIONS OF INSTITUTIONS OF HIGHER EDUCATION

BY

Peter A. Schwartz

Bachelor of Arts

Yale University, 1965

A Thesis Submitted to the School of Government and
Business Administration of The George Washington
University in Partial Fulfillment of the
Requirements for the Degree of
Master of Business Administration

May, 1971

Thesis directed by

Rodney Eldridge, Ph.D.

Associate Professor of International Finance

T139377

LIBRARY
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIF. 93940

ACKNOWLEDGEMENTS

Numerous administrators and educators have greatly facilitated the research conducted in connection with this project. Particular gratitude and appreciation is due William Johnson, George Washington University Budget Officer, who gave unstintingly of his already crowded schedule and provided valuable source materials with the observation that "this willingness and cooperation should always be part of what the university owes their students." The librarians, Mr. Choate, at the Office of Education, Mrs. Pentacost at the National Science Foundation, but especially Miss Lucy Haggart of the Naval Supply facility, are all recipients of my deepest gratitude for locating and loaning the sometimes obscure books and documents. Lastly, a special acknowledgement to Dr. Rodney Eldridge without whose encouragement and suggestions this project could not have been possible.

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		ii
LIST OF ILLUSTRATIONS.		iv
Chapter		
I.	INTRODUCTION	1
	Statement of the Problem Analysis of the Problem Methodology Summary	
II.	THE PLANNING AND CONTROL PROCESS	12
	Planning Objectives, Programs The Budget Control Systems	
III.	COLLEGE AND UNIVERSITY FINANCIAL MANAGEMENT SYSTEMS. . . .	31
	Classification and Definition Systems Planning Models Program Budgeting and Analysis Techniques	
IV.	CURRENT OPERATIONS AT THE GEORGE WASHINGTON UNIVERSITY . .	54
	The Master Plan The Four Year Budget Program Budgeting Study Economic Models and Analysis	
V.	CONCLUSIONS AND SUMMARY.	70
VI.	BIBLIOGRAPHY	78

LIST OF ILLUSTRATIONS

Figure Page

1. An Operations Research Approach to Problem Solving 17
2. Management Control 21
3. Anatomy of Management Information. 24
4. Data Organization 36
5. Structure of The System Model. 45
6. Cost Effectiveness Calculation 49
7. Sample Expense-Revenue Calculation 61

CHAPTER I

INTRODUCTION

Statement of the Problem

> U. S. campuses face their greatest crisis in the 330 years since the founding of Harvard. The problem is not radical student protest; it is a radical shortage of money . . . about 77% of all collegians now are attending schools that either are "headed for trouble" or are already "in financial difficulty." Administrators are being overeager to keep up appearances and duck hard realities. Many of them still are not willing to organize their priorities on a systematic basis.[1]

The financial operation of the university has taken a back seat to academic considerations for far too long. The hard reality that fiscal accountability extends to the bastions of higher education has only recently been given adequate attention. Despite huge sums from alumni, foundations, and the various levels of government in addition to student fees, our institutions of higher education have been thrown on the fiscal rocks. Speaking of some two thousand plus colleges and universities, Jacques Barzun, the former Dean of faculties and Provost of Columbia University, sees "a spectacle on three levels, like a medieval sculpture of the Last Judgement."[2] On one plane is an administrative apparatus struggling to keep instruction, research, and community services in balance and the corporation solvent. On another hand is the faculty beseiged from every quarter to impart its wisdom and yielding (or not) to these temptations and summonses possible and impossible. The

---

[1] Time Magazine, December 14, 1970.

[2] Jacques Barzun, The American University (New York: Harper and Row, 1968), p. 32.

third level is the very visible and vocal student body, often turning away from the education it seeks and tending to lump the once-revered university with the social evils to be reformed. It is to the first division, the administration of the limited resources, that this paper will be directed.

The broad emphasis of this study will be directed toward outlining a practical yet comprehensive system for the operational planning and control of university fiscal matters on the policy making level. In addition, and in order to test the applicability of the proposed methodology, the feasibility of its implementation in the case of George Washington University will be researched. The former process will necessarily be limited to a search of the current literature (secondary sources) touching on actual field research only briefly. The discussion and investigation of the suggested budgeting system in light of the reality of a reasonably representative university situation is an attempt to avoid the "pie in the sky" aspect of theoretically sound, but highly unfeasible suggestions; although this is by no means a guarantee of universal applicability. Specifically, the following questions will be addressed:

What are some of the concepts and techniques currently being utilized by corporate and governmental financial managers in the planning and control of current operations?

How have these techniques and concepts been assimilated and adapted to the theory and practice of educational financial administration?

Is the sum total of the academic, business, and public administration experience regarding planning and control applicable to, or actually being implemented by, The George Washington University?

Analysis of the Problem

Throughout its history, the American people have concerned themselves with the perpetuation and quality of the educational process. Its structure including management, support, and responsiveness to the community are unique although much of the basic philosophy behind this orientation has its roots in the Humanist tradition of the Renaissance and the nineteenth century German concept of intellectual achievement. The ideals of public service and education for a large proportion of the population are only a sampling of the signal contributions of the United States in this area. In developing this comprehensive educational system, little or no emphasis has been given to the financial implications of academic decisions. Today we find our leading universities facing an explosive situation.

> They spend huge sums and are desperately poor; their students attack them; their neighbors hate them; their faculties are restless; and the public, critical of their rising fees and restricted enrollments, keeps making more and more preemptory demands upon them.[3]

To date the panacea has been seen as more funds, larger foundation and government grants, not better utilization of existing assets.

The very heart of this critical situation can be simplistically stated and explained away as explosive growth. But it is more than this. The slipshod errors of intuitive decision making can no longer be disguised in the staticly secure financial bulk of the university. Faced with an enrollment which has swollen from 2.1 million in 1950 to more than 7 million in 1970, rigorous consideration of the costs and benefits of various alternatives has become a necessity. In the same two decades the percentage of college-age (18-24) persons actually enrolled in institutions of higher learning rose from 13% to 30%. The total operating budget of the more than

---

[3] Barzun, The American University, p. 2.

2500 such institutions is currently listed as being in excess of 13 billion dollars.[4] All these figures, although impressive in their own right are doubly important for what they promise for the future.

How have the schools themselves coped with this tremendous influx of students and the corresponding increased size and complexity of their administration? Not as well as one would like to believe. The Carnegie Commission Report presents a rather dismal picture including the morbid statistic that at least twenty one institutions have gone completely bankrupt in the last half dozen years.[5] Although not included in this category, the experience of the University of Pittsburg which escaped dissolution only when the state of Pennsylvania rescued them by absorbing them into the state university system is proof positive of the chaotic situation of university finance. The startling facts of their downfall are representative of the major areas of weakness evident in a large percentage of our colleges and universities.

Recognizing the increased demand of the war babies for education, Pitt attempted to keep pace with this demand by expanding their services without regard to their capital or revenue structure. In the ten year period, 1955-1965, graduate and professional (by far the most costly and least self supporting) enrollment increased by some 60%!! Yet no thought was given to the burgeoning costs. Large operating deficits were accepted without any plan or provision for decreasing or amortizing them. Instead of biting the bullet and severely cutting back on their offerings and paring expenses, the university plunged on clutching the straw of a ten million Equitable Life Insurance Co. loan to continue operating. Finally with every

[4] Digest of Educational Statistics, 1969 (Washington; U.S. Department of Health, Education and Welfare, 1969), p. 59.

[5] Cheit, M., Report of the Carnegie Commission on Education (Sacramento: The Commission, 1970), p. 57.

avenue exhausted and Equitable unwilling to throw good money after bad, the University threw itself at the feet of the state.

This debacle might have been avoided if any of several rudimentary principles of sound management had been followed. The incredible collapse of a major university is not as shocking as it might be in an era which has seen the feet of clay of giants like Penn Central, but that this could happen with the administration and trustees largely ignorant of their true financial situation is unbelieveable.

Or is it? As early as 1961 a neglected prophet of doom and educational observer, Beardsley Ruml railed at the elaborate structure and its inherent inefficiencies.

> Structure--at our institution the bureaucrat has been raised to an unfortunate plateau, these executives often regard students and teachers as nuisances, without whom they could better and more easily fill out their forms and file reports. We have vice chancellors and assistant chancellors in excess of any institution I have discovered. Each of these is surrounded with a flock of administrative assistants, executive assistants, and other persons, well adorned with titles. In the category known as deans and directors, our directors positively exceed, quantitatively of course, those of any private institution in this land, and with each director we discover, a multitude of assistant and associate directors, secretaries, stenographers, clerks, and receptionists. In short we have seen arise in our midst, a "New Class" of academic parasites who have institutionally grown in accordance with Parkinsons Law.[6]

Pittsburg had lost control of its destiny. Perhaps because of its bureaucracy, perhaps because of an abysmal planning and budgeting committee; the fact of the matter is that the trustees had lost control. Equally lamentable there was no audit or evaluation process to discover this fact. All this speculation in retrospect is not purely malicious, but hopefully both a warning and an object lesson for all administrators. It is the aim of this paper to serve a similar function by recognizing problem areas and proposing some specific procedures to forestall disaster.

---

[6] The Pitt News, Mar. 13, 1961.

The need for budgetary planning should be patently obvious to any national administrator. The desire to escape from the highly volatile atmosphere of crisis management to the serenity of a sysmatized environment is inherent in wise managers. A continuous cycle of realistic and timely planning is seen as the just reward of those who seek to lead. The results of unstudied snap decisions serve as a constant reminder of the pitfalls of unplanned action. The institution of a black studies department without adequate research as to its true costs can often be as disastrous as outright refusal of student demands. Similarly the hiring of a highly respected professor at the behest of the faculty or interested trustees can spell years of hidden expenses. Faculty salaries (and the related costs of secretaries, special facilities, and heavy independent research) represent a long term committment which education, unlike industry, can not reduce in accordance with the economics of decreased demand. Even the seemingly most insignificant decision may represent an addition to the already high percentage of fixed costs characteristic of our colleges and universities.

But sound budgeting decisions, budget formulation, and comprehensive planning are only one side of the fiscal coin. Despite the decentralization evident in the majority of the ever expanding university complexes, control of expenditures must be maintained. Whether or not the responsibility and the authority for sound financial management has been delegated to the deans and department heads, the ultimate responsibility rests with the university president. He alone is responsible for first insuring that the system is consistent with the principles of sound financial management. Secondly he must promulgate and insure comprehension by all concerned whether by manuals, directives, or personal contact. Lastly he is concerned that the information available both to his office and those of his

deans is timely and accurate.

> Educational institutions continue to be classed among the more backward of organizations insofar as administrative procedures are concerned. Tradition has tended to rule. Vast quantities of new monies are being invested in educational plants, equipment, and techniques, but on the basis of academic programs and approaches already obsolete.[7]

A part of this history of less than auspicious fiscal administration lies in the difficulty endemic to most service-oriented organizations of measuring output of their programs. However, the success of the Defense Department in quantifying some rather ethereal benefits of our military establishment indicates that this is possible.

The lack of quantifiable standards such as the return on investment measure of business profitability is readily apparent. The business firm is evaluated on both its ability to continue as a going concern (solvency) and its use of resources (profitability). Higher education and education in general has been recognized as a break even enterprise where solvency is the main criteria. Rigidly interpreted, a cash flow analysis of the university's solvency with an overall goal of a zero balance is a valid approach. Too often a highly insolvent balance sheet position has been neglected and overridden by the fact that we need education at any cost. Unfortunately, the seemingly limitless enthusiasm of the sputnik era has faded, and those laissez-faire days are gone forever. Education must compete with the more visible demands on our Gross National Product. However, as James Conant, a former Harvard University President, has observed, "of the three requisites for a university-solvency, a student body of quality, and an outstanding faculty, the solvency aspect is most

---

[7] C. E. Graese, "University Management: A Total Preview," _Management Controls_, April, 1968, pp. 75-76.

often forgotten and neglected."[8]

Methodology

As mentioned earlier, this study is designed to give a documented compilation and combination of the existing secondary sources on university operational budgeting. This will include a review of the overall administrative process, the position of the budget apparatus, and implementation by the university. The experience of business and government will be compared and combined with existing systems in institutions of higher education. In all three areas attention will be focused specifically toward identification of objectives (in contrast to the broad mission stated in the catalog), formulation of long and short range strategies based on the realistic breakup of the objectives, and the resultant budget detailing process of planning and control. The emergent computer technology will be selectively utilized with an eye toward reasonable cost outlays. This will involve some model building, and the commensurate identification, classification, and establishment of procedures. Systems will be tested with an eye toward answering the following questions. What are the objectives? What decision making process or analytical techniques are relevant? Who is responsible for what decisions and are they necessary? Is the administrative structure compatible with the system or model suggested? Having arrived at some tentative answers to these questions, George Washington University will be surveyed and analyzed as a likely vehicle for implementation. As a result of this test of their compatibility various tentative conclusions regarding first the validity of the

---

[8] H. R. Bowen, Finance of Higher Education, (Berkley, California: Carnegie Commission, 1968), p. 16.

procedures and processes proposed and secondly the possibility of their application granting the wide range of variation in institutions of higher education.

Chapter II, The Planning and Control Process, will be directed toward a description and analysis of the implications of business and government experiences and techniques of financial management. The formulation and implementation of several varieties of planning and control systems for current operations are offered as well as any pecularities of the application which might tend to limit their general usefulness or universal acceptance. This examination of comprehensive management information systems based on clearly delineated criteria both as a basis for planning and control will serve to illustrate the superiority of this total systems approach over the segmented and functionally bound, line item system. In the governmental field, particular emphasis will be directed toward the advantages and disadvantages of the PPB system with emphasis on specific agency experience.

Chapter III, College and University Financial Management Systems, will focus on the limited, but extremely valuable, research existing and currently in process regarding university current operations. The efforts of Drs. Swanson, Arden, and Hill in their _Financial Analysis of the Current Operations of Colleges and Universities_ are judged especially relevant to this study area. Additionally the results of the Henle Report and a recently completed study under the auspices of the National Science Foundation, _University Cost Structure and Behavior_ will serve as a background against which the actual experiences of several universities can be studied. The predominance of public institutions as leaders in adoption of exemplary practices is seen as a consequence of the demands of state

funding bodies for timely and accurate accountability. The increased role of the federal government's grants in the financial operations of all schools public and private is only beginning to be felt.

Chapter IV, Current Operations at George Washington University, is an in depth examination of the efforts of the University to update their practices. In addition to university in house planning and administrative documents, this section will draw heavily on the experience of the Controller and Budget Officer to adapt a system of program budgeting to the existing framework with all the inherent considerations. The proposals of the previous chapters will be reexamined in light of existing situations and particular problem areas.

Summary

As may be gathered from the preceding, this study is directed toward first realizing what sound financial practices proven in business or government are applicable to the university situation, and secondly, an acid test or at least some concrete experience as to their practical application in a typical real life situation. The bias toward a comprehensive systems interface approach is granted and viewed as being within the realm of feasibility. Better information and the better decisions which will stem from this information are the answer, and they are increasingly dependent on the use of the developing technology and financial expertise to cope with the size and complexity of our educational environment.

> It is the essence of decision making, therefore to choose alternative ends and to ration scarce resources to their accomplishment. At this level of description, No significant distinction exists between profit and non-profit organizations or between private and public organizations. All require the ordering or goals, the

> analysis of their relative contribution to the great aims of the total undertaking, the development of plans, the measurement of alternative resource imputs and their relation to progress toward objectives, rational choice of feasible ends, allocation of means, monitoring of progress and appraisal of results. The budget process is the activity through which this work is done. The budget is the instrument through which the process is made operational.[9]

The university that realizes this and institutes a financial system commensurate with their instructional curriculum has met the challenge.

---

[9] M. Anshen, "The Federal Budget as an Instrument for Analysis," Planning and Management (Santa Monica: Rand Corporation, April, 1965), p. 1.

CHAPTER II

THE PLANNING AND CONTROL PROCESS

The primary thrust of this chapter will be to orient the reader with respect to the "state of the art" as regards existing planning and control systems and philosophies. This is not meant to be a rehash or survey of the classical bases of the planning and control functions as envisioned by management theorists, but will be directed toward establishing practical boundaries and actual experience in a variety of areas. In qualification of the above, some abbreviation and selectivity will be exercised in order to review only those facets judged to contribute materially to the special situation of current operations management, and concurrently, having possible applicability to the problem of school finance. Exemplary working cases of successful practice in the business community will be examined for evidence of a common technique. Additionally, an area which has shown considerable promise in the development and implementation of innovative practices is the public administration or governmental arena. The pressure of Congressional scrutiny and accountability to increasingly knowledgeable and irate taxpayers has given impetus to development of efficient methods. The existence of a business corporation responsible to its shareholders has tended to reenforce the status quo attitude which seeks to satisfy or optimize versus maximization of profit (or minimization of costs). It is hoped that some synthesis of the innovative attitude of government and the established practical experience of business will yield salient benefits to struggling college and university administrators.

Planning systems regardless of application must incorporate or provide for the satisfaction of certain definite milestones. The first requires a formulation, statement, or agreement regarding the goals or objectives of the organization.

The hypothesis that planning is here to stay as a vital part of organizational operation is readily accepted. Almost without exception, businesses have plans, long range plans, and short range plans to implement the former on a yearly basis. The prevalence of master or long range plans is indicated by the fact that in 1960, over sixty percent of the Fortune five hundred list of manufacturing companies had engaged in long range planning for five years or more.[1] Today the percentage would be even higher. The distinction between what is long range planning for one company and what is short range planning for another is nowhere clear, and heavily dependent on the type of industry or business. They vary from utilities with 25 year plans to consumer product companies which plan 6 months ahead. The notarity of the Russian Five year plan in the early sixties gave rise to the five year period as the norm for planning, but this has been gradually extended to ten and even twenty five years. The inextricable nature of long and short range planning is enunciated by one company president: "The keystone of our entire program at Hewlett-Packard Company can be summarized in the statement that we believe tomorrow's success is based on todays performance."[2] Ernest Dale postulates that the rational for the tremendous increase in long range planning lies in the increased speed of technological change, the need for coordination as companies grow larger, and the increased emphasis on

---

[1] E. Dale and M. Kaeni, "Long Range Planning," Readings in Management (New York: McGraw-Hill, 1965), p. 25.

[2] D. Packard, "Assuming the Company's Future," (American Management Association, (New York: General Management Series, No. 175), p. 27.

spotlighting accountability.[3] A study by the Bureau of Business Research at the University of Pittsburg concluded that among the ten companies chosen for intensive study every one was guilty of poor planning, and that this shortcoming was the major cause of failure in nearly every case.[4] The advantages of formalized planning are incontestable.

The type of objectives proposed by businesses varies widely as a function of the top management's philosophy. The Lincoln Electric Company states their goal as being "to make a better and better product to be sold at a lower and lower price. Profit can not be the goal."[5] United States Steel weighs in with a more conventional

> To make and sell quality products competitively and to perform these functions at the lowest attainable cost consistent with sound management policies, so as to return an adequate profit after taxes for services rendered.

Texaco sees a two fold objective of offering the best service first with profit a secondary consideration.[6] The Woodward Governor Company lists its purpose as

> To provide the opportunity, atmosphere and protective legal framework in which two or more persons may combine their capital, time, talents and energy in the production of goods and services as a means toward accomplishment of each individuals legitimate objectives.[7]

---

[3] Dale, op. cit., p. 25.

[4] A. M. Woodruff and T. G. Alexander, Success and Failure in Small Manufacturing (Pittsburg: University of Pittsburg Press, 1958), p. 100.

[5] James F. Lincoln, Intelligent Selfishness and Manufacturing. (New York: Lincoln Electric Company Bulletin, No. 434). This company is admittedly not typical since they are organized on a cooperative basis with the employees sharing in the profits to the extent that these earnings constitute forty percent of their total wages. Any outside stockholder would be reluctant to invest in a firm with these stated goals.

[6] John F. Mee, "The Essential Nature of Objectives," Management edited by Harold Koontz and Cyril O'Donnell, (New York: McGraw-Hill, 1964), p. 49.

[7] Ira C. Martin, The Woodward Way, (Rockford, Illinois: Woodward Governor Company, 1969), p. 2.

These general, and in the latter case rather socialistic, objectives must in turn be quantified with definite measures of service, profit, or employee contentment. Peter Drucker has isolated eight areas in which objectives of performance and results should be set; market standing, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude, and public responsibility. In considering their total objectives, managers weight each of these areas in accordance with their particular company and the business climate. To focus on profits to the exclusion of all else would be equivalent to corporate suicide. The present hue and cry over the ecology efforts of some companies should illustrate this point. Further, the maximization of short run profits to the exclusion of the liquidity and the existence of the firm is counterproductive. The familiarity of measures such as return on investment or return on equity as indices of profit is indicative of the relative ease with which business firms have quantified the old profitability portion of their objectives. Similarly, the current vogue of optimizing the return to the stockholders is readily measured. Less familiar, but by no means neglected, are those standards to determine the success in other areas. Some illustrations of these are: physical and financial resources--the liquidity and leverage ratios, total asset size; worker performance and attitude-productivity measures, percentage of employee stockholders, attrition rates; public responsibility--money spent, civic awards, absence of attacks. The list is not exhaustive, but varies with the emphasis of the individual company. Although these objectives are in reality the end of the entire management process, they must be firmly established initially. The planning process is built on a "how do we get to where we want to go" orientation. Following naturally in the process is the development of various alternative approaches to these goals. Next these

prospective actions must be viewed in light of the premises or assumptions made as to the climate or environment in which the organization will be operating. Although no estimate is likely to be perfect, the degree of uncertainty regarding the future conditions can be quantified and integrated with the examination of the alternate proposals. If the previous stages in the process have been carefully developed, the decision as to the best program is relatively easy. Inherent in the entire process is participation by and communication throughout the organization in order to insure cooperation, acceptance, and smoother implementation.

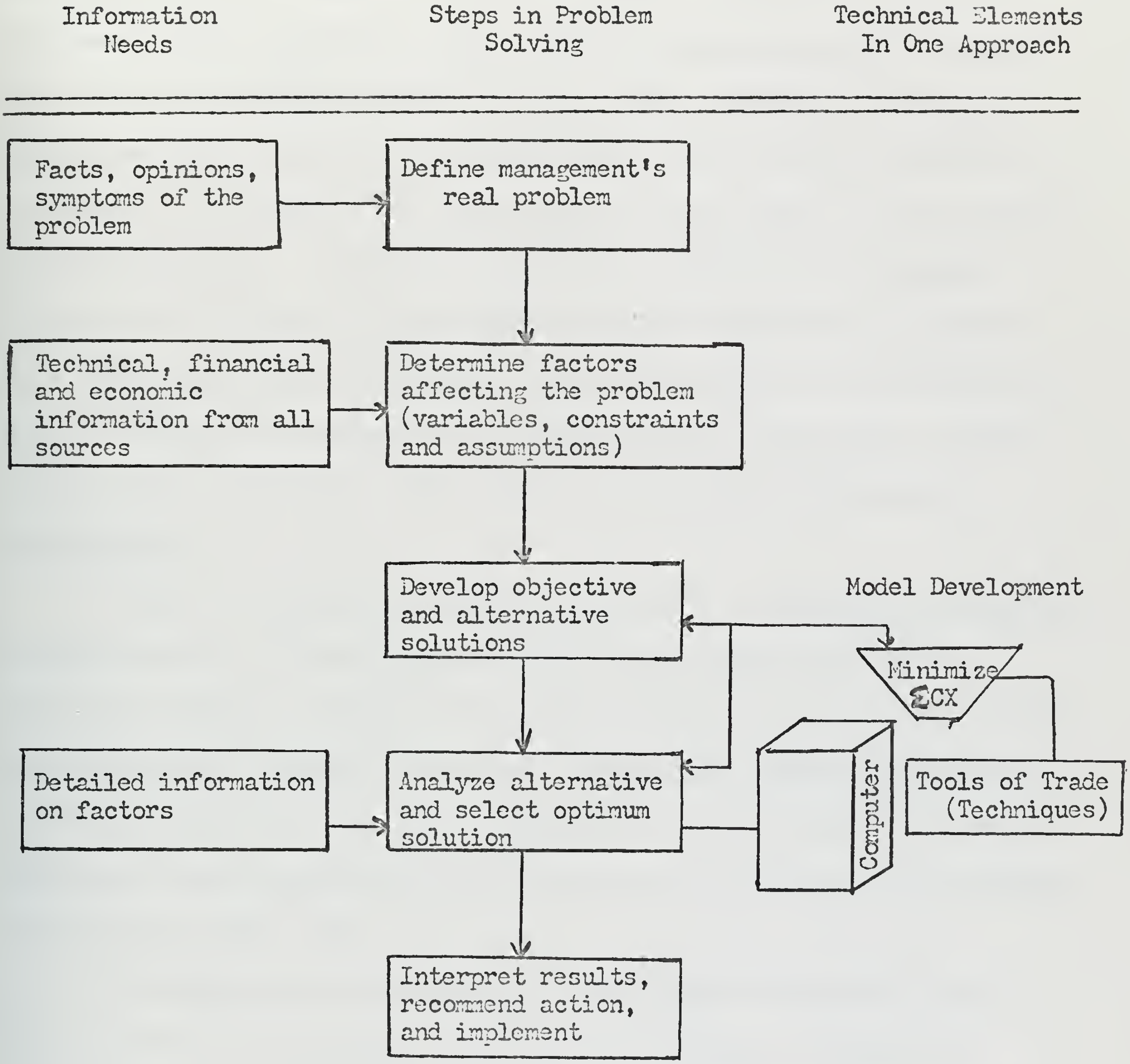
The formulation of alternative programs directed at the attainment of the previously mentioned objectives constitutes a major portion of the planning cycle. It is a true cycle in that all plans are constantly updated as to their objectives, programs, and actual implementation until such time as they are overtaken by events. Preliminary determination of variable and non variable inputs affecting the proposed programs is one of the next steps. It serves as a background for development of quantitative models and insures that the desired information for decision making and valid comparisons are derived. The prevalence and sophistication of econometric models of the national economy serves as a launching platform for operations researchers. Their job is "to provide the basis for arriving at an integrated and objective analysis of operating problems."[8] This mathematical simulation usually with the aid of a computer can be done "in house" or on a contracted or consulting basis depending on the nature of the firm's talent and analytical resources. Figure (1), adapted from a leading management consultant's outline illustrates this process. Manipulation

---

[8] Charles C. Hermann and John F. Magee, "Operations Research for Management," Harvard Business Review, July - August, 1953, p. 106.

FIGURE 1

AN OPERATIONS RESEARCH APPROACH TO PROBLEM SOLVING[9]


Information Needs
Steps in Problem Solving
Technical Elements In One Approach
Facts, opinions, symptoms of the problem
Define management's real problem
Technical, financial and economic information from all sources
Determine factors affecting the problem (variables, constraints and assumptions)
Develop objective and alternative solutions
Model Development
Minimize ΣCX
Detailed information on factors
Analyze alternative and select optimum solution
Computer
Tools of Trade (Techniques)
Interpret results, recommend action, and implement

---

[9] Robert A. Hammond, "Making Operations Research Effective for Management," *Business Horizons*, Spring, 1962, p. 76.

of the model utilizing linear programing techniques produces several variations or possible mixes by varying simultaneously one or more of the parameters and/or inputs. Although not a replacement for the more familar break-even analysis, fixed and variable costing, and pro forma financial statements, these operations research methods greatly simplify or include the necessary information producing a more valid comparison. The application and incorporation of probability theory to the various alternatives is similarly an extension and improvement of the old high, low, most likely estimate technique. The model is basically a combination of historical information, objectives and constraints, coupled with weighted forecasts of a future operating environment. Despite the progress in this field, it has not obviated the necessity of a final decision by the manager who must combine these quantitative factors with any subjective or qualitative ramifications.

The use of increasingly complex quantitative techniques has hopefully reduced the area of uncertainty within which the manager must choose a particular program. Throughout the analysis process, he must insure that the assumptions being utilized in the cost-volume-profit manipulations coincide with the objectives of the firm. Ultimately, the choice lies in the determination of which particular mix best satisfies or is closest to the rankings or priorities of the firm.

The budget as an instrument of both planning and control insures coordination of the management effort. It is a further refinement or restatement in quantitative terms of the selected program. In one package it provides a comprehensive statement of the program, a operating guide for all levels, and a standard for performance measurement. Formulation may occur only after some decision as to the optimum program has been made, or

more commonly at an earlier stage in order to clarify the ramifications of suggested options. Contrary to popular belief, the budget is not confined to a dollars and cents statement, but can be expressed in terms of man-hours or plant utilization. "Through numerical statement of plans and the breaking of these plans into components consistent with the organizational structure budgets correlate planning and allow authority to be delegated without loss of control."[10] The conventional operating budget assigns costs to line items of expense such as labor, rent, and overhead. Budgets vary in detail and emphasis depending on the organizational level and purpose. Budgeting has outgrown its inflexible image and is routinely formulated to vary on a volume basis. However, only recently have businesses begun to examine their budget as being a function of need rather than incremental changes from existing budgets. This concept will be examined later in connection with governmental PPBS system.

Control systems should be oriented toward monitoring and adjusting the operations of the organization. Fayol stated the function as

> In an undertaking, control consists in verifying whether everything occurs in conformity with the plan adopted, the instructions issued, and principles established. It has for its object to point out weaknesses and errors in order to rectify them and prevent recurrence. It operates on everything; people, things, actions.[11]

This definite connection with the planning phase is vital to any system of management. The proponents of integrated planning and control have formalized what should be inherent in a comprehensive approach.[12] The very heart of any system must lie in establishing good standards, a process for data collection,

---

[10] Harold Koontz and Cyril O'Donnell, Principles of Management, (New York: McGraw-Hill, 1968), p. 651.

[11] Henri Fayol, General and Industrial Management, (New York: Pitman Publishers, 1949), p. 107.

[12] John Tomb, "A New Way to Manage: Integrated Planning and Control," California Management Review, Fall, 1962, p. 57.

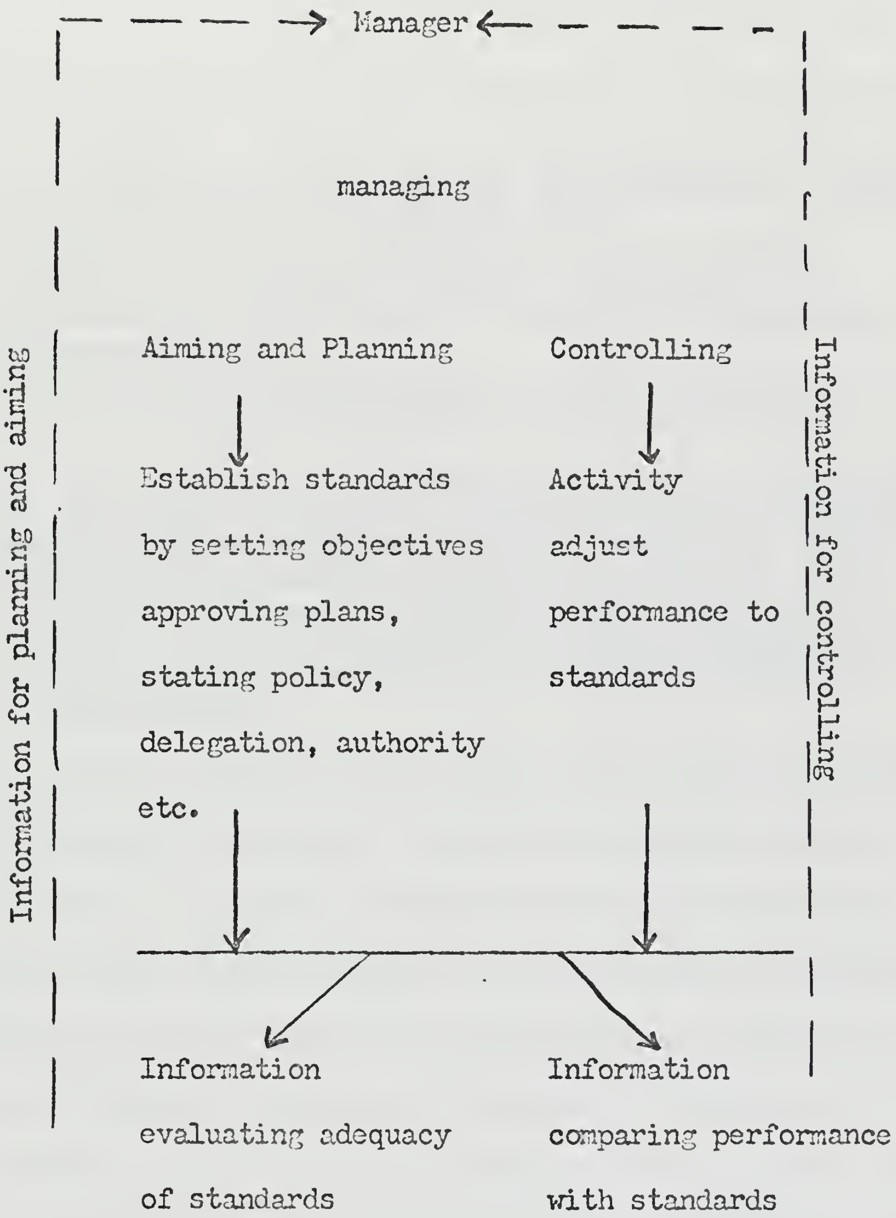
comparisons with standards, and corrective action. This flow is illustrated by Figure (2). The simultaneous inter-connected nature of planning and control with its intersection in the manager is crucial to a successful organization.

The central problem in all control systems lies in deciding which information is needed, how it can be best obtained, and what should be done with it. Timely and adequate data are the key to success. By timely this does not imply that elaborate and expensive real time systems must be installed on a wholesale basis, but it does eliminate hoary historical information derived too late for anything but a post-mortem. The decision as to "adequate" criteria presents a little more trouble in that the advanced technology has the capability of providing the individual manager with too much data. The advent of the high speed printer has prevented many executives from stopping and defining clearly just what data they require, relying instead on trying to pick the wheat from the volume of chaff manually. Managers long used to operating in the dark, ignorant of true current costs and individual performance, are overwhelmed by the veritable wealth of data which the computer can provide. Sorting and determining which data should go to which individual is a necessary but frequently overlooked part of every control system.

The rise of Management Information Systems has focused attention on the established control function. These systems range from simple manual processes to intricate computer programs on a real time basis. All of them are directed toward designing a system or method to provide the decision maker with only the necessary information at the time he needs it. American Airlines' director of information systems, Paul Saunders who was responsible for the development and implementation of the highly sophisticated and

FIGURE 2

MANAGERIAL CONTROL[13]


Manager
managing
Aiming and Planning
Controlling
Establish standards by setting objectives approving plans, stating policy, delegation, authority etc.
Activity adjust performance to standards
Information evaluating adequacy of standards
Information comparing performance with standards
Information for planning and aiming
Information for controlling

---

[13] Douglas Sherwin, "The Meaning of Control," Dun's Review and Modern Industry, January, 1956, pp. 45 ff, (adapted).

successful SABRE total information system sees the functions of these systems as:

1. Considers the full effect of a decision in advance by supplying complete, accurate, and timely data for use in planning and decision making process.
2. Eliminates from the planning and decision-making processes the problems associated with the use of inconsistent and incomplete data by providing a means for preparing and presenting information in a uniform fashion.
3. Uses common data and methods in the preparation of long and short term plans.
4. Identifies, organizes, and measures significant past relationships to forecast future relations through the use of specialized or sophisticated mathematical techniques in analyzing data.
5. Merges financial, production, and marketing data to produce significant measures of performance in order to facilitate the controlling of present costs and making of planning decisions with the minimum processing of data.
6. Meets the needs of each organizational unit with a minimum of duplication while at the same time serving the organization as a whole.
7. Reduces the time and volume of information required to make decisions by reporting to each level of management only the necessary degrees of detail, and usually only the exceptions from the standard or norm.
8. Uses personnel and data processing equipment effectively so that the optimum in speed and accuracy is achieved at the lowest cost.
9. Presents the data to those responsible for decision-making and planning in a format that minimizes the time or effort needed for analysis and interpretation.[14]

The design of such a system requires first and foremost a decision as to what reports (output) is required. Secondly a knowledge of what information (input data) is required to produce the desired reports--in other words what files have to be maintained. Next the process by which the input is manipulated to produce the output is developed, and lastly, the equipment (hardware) necessary to implement the system is selected. In addition to the airlines' total system, less comprehensive subsystems have been developed for inventory control, general logistics, management and

---

[14] Paul Saunders, "Management Information Systems," Systems and Procedures edited by Victor Lozzaro (Englewood Cliffs, New Jersey: Prentice Hall, 1968), p. 427.

even some integrated financial and physical measure.[15] The improvements over the DuPont system of manually updating charts is recognizable, but the concept remains the same.[16]

One final chart Figure (3) illustrating the total management control environment and some characteristics of an information system as viewed by one of the practioners in this area is pertinent. The common points of this model with one in chapter three should be noted. The current emphasis on a total (rather than merely a personnel, inventory, etc.,) system is a result of the advanced computer technology. These systems assume a standard data base element in that information throughout the system is identifiable by a common number of symbol regardless of its source or usage. It should be remembered that all of these systems should be viewed in a pragmatic sense and not accepted en masse without regard to the cost ramifications. The institution of a million dollar information system to manage a hundred thousand dollar concern may be unfeasible. The techniques retain validity regardless of scale, but the actual system should be thoroughly studied prior to any acceptance.

Despite almost continuous adverse publicity and criticism from all sides, the governmental arena has not been idle in the field of planning and control systems. The magnitude and complexity of the automated command and control systems exceeds most all private industrial systems. Unfortunately their security classification precludes an examination of this huge management

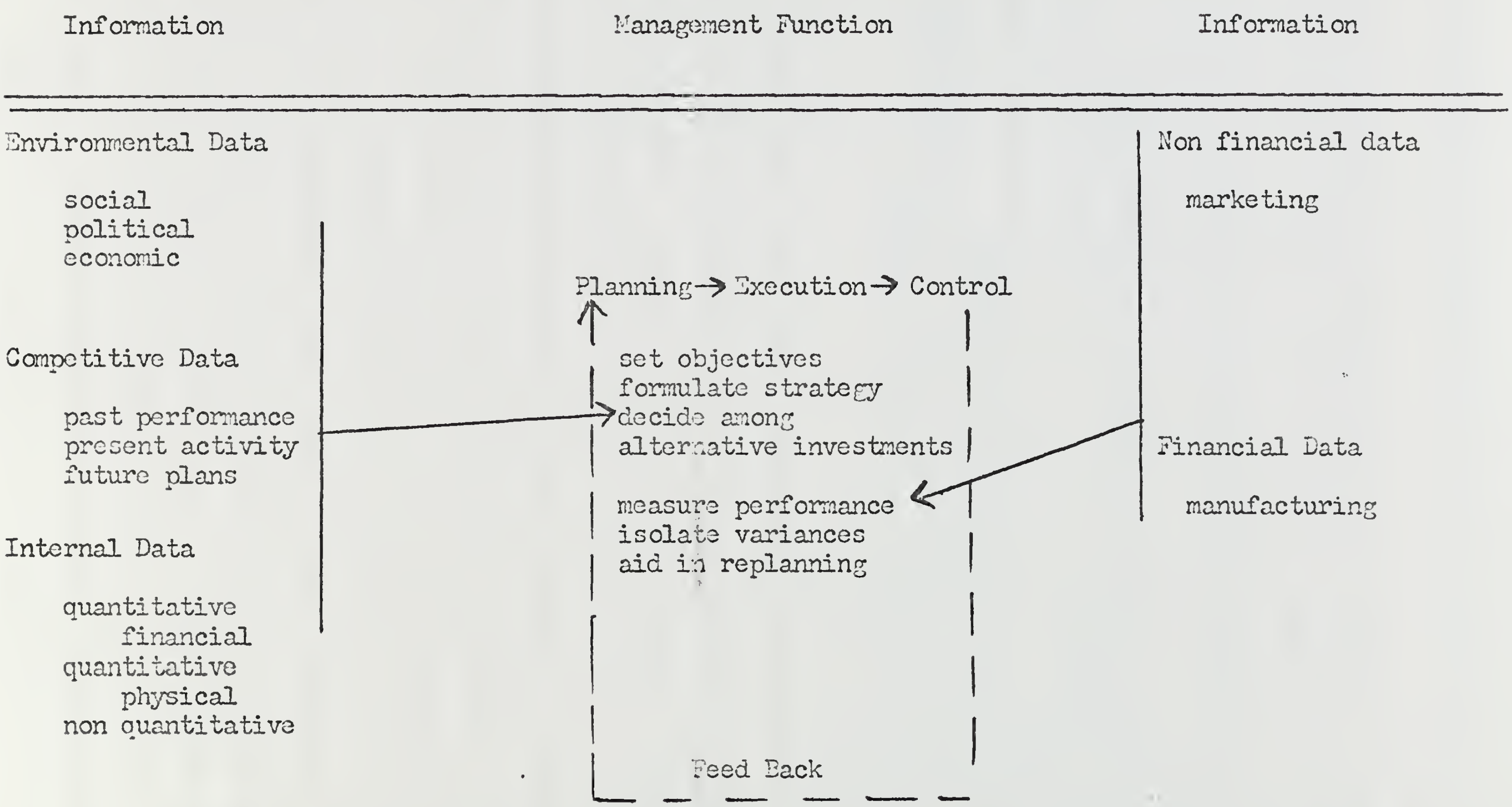
---

[15] See E. H. Bowman and R. B. Fetter, *Analysis for Production Management* (Homewood, Illinois: Irwin, Inc., 1961); E. W. S. MyKay, (ed.), *Essays on Physical Distribution Management* (Washington, D. C.: Traffic Service Corporation, 1961); and S. H. Brewer and J. Rosensweig, "Rhochrematics and Organizational Adjustments," California Management Review, Spring, 1961; for a detailed discussion of the science of material flow on "rhochrematics."

[16] C. A. Kline and H. C. Hessler, "The DuPont Chart System for Appraising Operating Performance," *Financial Decision Making*, ed. by E. Mack, (Scranton, Pennsylvania: International Textbook Company, 1967), p. 163 ff.

FIGURE 3

ANATOMY OF MANAGEMENT INFORMATION[17]



---

[17] D. Ronald Daniel, "Management Information Crisis," Harvard Business Review, September-October, 1961, p. 116.

information system. Probably the most widely known managerial advance pioneered by the government is the development of the Planning, Programming and Budgeting Systems approach and its implementation, first in the Department of Defense and eventually throughout the government. Less publicized has been the development of PERT (Program Evaluation and Review Technique) in connection with the Polaris missile submarine project. Both these tools are not just theories, but have been tested, integrated, and accepted by the country's largest organization, the federal government.

The applicability of PERT, which in conjunction with a similar technique, the Critical Path Method, developed by the DuPont Company make up the area known as "network systems", to college and university current operations may appear remote. However, the network systems provide a valuable and systematic insight into the planning process. Both these systems enable the manager to predict the order in which different activities or elements within his program can be scheduled. The critical steps which the network approach highlights are seen as:

1. A disciplined basis for planning the project.
2. A clear, easily understood picture of the program's scope.
3. A method for evaluating alternative plans and objectives.
4. A realistic schedule for all operations.
5. Effective communication among the various personnel involved in the project.
6. An indication of activities or jobs that are critical from a schedule standpoint.
7. Direction of management attention to critical areas.
8. Precise evaluation of actual time and cost performance against schedule.
9. A frame work for improved scheduling of manpower, cash, equipment, supplies, and other resources.[18]

This enforced channeling of programs insures complete evaluation and efficient utilization of resources. The improvement over an old bar or Gantt chart

---

[18] M. Flaks and G. L. White, *Introduction to PERT/CPM* (New York: Booz, Allen and Hamilton, 1967), p. 2.

projection is patently obvious. The networks are used in both the planning phase and the control stage to insure control of an intricate and dynamic situation. Computer programs have been developed to handle the considerable volume of simultaneous routing, but the principle of insuring that the material needed for step two of a projection arrives exactly upon completion of step one and is performed concurrently with the unlimited number of parallel processes is fairly simple. The selection of the critical path, shortest and most efficient use of financial and physical assets is a logical extension and result of the planning process.

The PPBS or program budgeting concept was the brainchild of David Novick of the Rand Corporation. His article, Efficiency and Economy in Government Through New Budgeting Procedures advocated a departure from the old line item objective or incremental approach. He viewed this new orientation as a solution to the problem of the competition between management, control and planning forces by integrating one process in a matrix arrangement which looked at the broad uses or applications of funds. The problem of defining what a program encompasses has prevailed throughout the evolutionary process, but Novick's definition of a program as "the sum of the steps or interdependent activities which enter into the attainment of a specified objective and is developed or budgeted in terms of all the elements necessary in its execution."[19] The introduction of program budgeting into DOD in 1961 by men like Alain Enthoven and Charles Hitch meant that instead of looking at an Air Force, Navy, etc. budget, top managers would have readily available the cost of such programs as Strategic Retaliatory Forces, Airlift and Sealift Forces, and Research and Development.

---

[19] David Novick, Which Program Do We Mean in Program Budgeting? (Santa Monica: Rand Corporation, 1954), p. 17.

Once the various programs and program elements such as Minuteman missiles or Bomber forces had been identified, all the relevant costs were then collected and economic systems analyses, using cost-benefit techniques, would be performed to make valid comparisons. Every bit as much as a business firm, the government was in the business of rationing scarce resources to competing programs (investment alternatives), and needed to insure efficient utilization.

Secretary of Defense Robert McNamara implemented the program budget system within DOD in FY 1963 with generally positive results. So much so, that it was extended by President Johnson to all departments and agencies in 1965. This system of program budgeting is especially pertinent to a discussion of possible applications in the academic sphere since the problem of defining the output or objective of a military program is closely akin to the delineation of a university program. Deterrence or defense or striking power is equitable within the ethereal product of education or learning.

Some further thoughts on this problem, of what is a program, are offered. Charles Hitch and Roland McKean in their book, The Economics of Defense in the Nuclear Age:

> Let us illustrate the distinction between a program and an object (of expenditure). Certain activities of the Air Force, the Army, and the Navy produce retaliatory striking power or deterrence, and these activities may be grouped together and called a program. In providing deterrence, the sources use missiles, manpower, food, paper clips, and transportation--intermediate items which may be called 'objects of expenditure'. . . Just what one means by an 'end product' or a 'program' is not unambigious. Is Military Air Transport Service, a program or simply an activity supporting say, the Tactical Air program? Or is even the latter merely something to be purchased for a program that might be called 'deterrence and fighting of limited wars'? Even such tasks as providing nuclear striking power and providing forces for limited war have interrelationships. Neither is solely a supporting activity of the other. It may seem that one is driven to regard every military item and activity as an object purchased for and contributing to one program--national security.[20]

---

[20] Charles Hitch and Roland McKean, The Economics of Defense in The Nuclear Age, (New York: Anthenum, 1965), p. 49.

The implications of the above as it affects the organizational structure of an established hierarchy are evident. The adoption of program budgeting has created some shifts and new positions in the Department of Defense. Unfortunately, the hidebound service traditions die hard, and the economic efficiency considerations often must be subordinated to political and personnel considerations. The expansion to other agencies has met similar problems.

In the area of education for example, education as a program remains one of the most widely dispersed activities in government. "In the fiscal 1965 budget funds for education were scattered through more than forty agencies."[21] The U. S. Office of Education's expenditures constituted only about one-fifth of the total educational budget, and any effort to establish just what, how much, or how well various elements contributed to the whole is almost impossible. President Nixon's proposal to reorganize the Cabinet departments is a valid attempt to try and bring some correlation between the organizational structure and the budgeting structure. Programs such as Human Resources are more in accord with Novick's definition of a program as the ultimate use of the funds.

Along with a collection and grouping of all elements of a program,

> PPBS provides for the application of a battery of new techniques, such as systems analysis and cost-benefit analysis, to try to increase the possibilities of making rational choices between alternative means of pursuing these objectives.[22]

All of these techniques imply some measurement of the social costs and benefits and various programs. The relatively easy case of the benefits of a dam, water and power with established market prices presents no problems, but attempts to quantify the benefits of outdoor recreation expenditures is

---

[21] Virginia Held, "PPBS Comes to Washington," The Public Interest, Summer, 1966, p. 106.

[22] Virginia Held, "PPBS Comes to Washington," The Public Interest, Summer, 1966, p. 105.

considerably harder. One author's solution involves the use of "merit-weighted-user-days."[23] The simple raw measure of "user-days" (number of people expected to use the park times the length of their stays) is weighted by a judgement of the social merit of a day spent by a child in the wilderness has more lasting value than an adult's picnicing in a crowded, noisy park; that the marginal utility of additional recreation declines as larger amounts are made available; and that equity requires the government to provide more recreational opportunities to those who most need them and can least afford private alternatives.[24] Often the measures developed as proxies for real social benefit are crude or artificial, but their value lies in the approximation of at least some segment of the decision process. It is an attempt to increase awareness of the probable effects and consequences of alternatives choices and the factors explicit and implicit which impinge on their judgement.

The applicability of these methods and principles from the business and governmental arenas to the field of educational finance is viewed as being excellent. Institutions of higher learning must perform this function in some organized fashion. The previously discussed systems have proven highly successful. In an economic sense the similarities between the business and public administration experience are far more numerous than the dissimilarities. A university is unlike a business firm in that it is not concerned with showing a profit over and above its expenses, but the broad objectives of the firm (to make a profit and continue as a going concern) have much in common with those of the university (to break even and survive as a quality institution). The same type of planning and control information is required

---

[23] Robert Dorfman, Measuring Benefits of Government Investments, (Washington D. C.: The Brookings Institute, 1965).

[24] Held, PPBS, p. 110.

to operate at the breakeven point as at a profit level. The university, public or private, is competing for scarce resources be they state appropriations or a student's tuition.

The concept of the program budget has been accepted as being in accord with sound accounting principles. The production of services by both the academic sphere and the governmental system would indicate some commonality and possibility for profitable adaption of proven methods. The same problems of quantifying their output is present in both cases, but as previously stated, the elimination of some portion of the uncertainty can substantially improve decision-making. In short, educational administrators, decrying the uniqueness of their situation, have hidden their heads in the sand too long.

CHAPTER III

COLLEGE AND UNIVERSITY FINANCIAL MANAGEMENT SYSTEMS

The field of educational administration is generally characterized by a frightening paucity of current literature in the areas of planning and control. One of the pioneering efforts in this field was a collection edited by Dexter Keezer entitled Financing Higher Education: 1960-70. The contributors to this volume presented articles on the entire range of the economics of higher education, but the specific problem of better utilization of resources, more accurate pricing or costing, and cost analysis was closely scrutinized by Seymour Harris, Chairman of the Economics Department, Harvard University.[1] His article looks at the history of these areas and proposes some of the future directions that management attention and research should take. In the same volume, Sidney Tickton proposes "The Long Term Budget Projection: A New Management Tool for Colleges and Universities." This excellent article outlines in extensive detail the specific steps necessary for long range planning. He takes the historical data from a small college, some forecasts and assumptions about future economic conditions, and the objectives of the college itself to develop four pro forma income and expense worksheets covering the educational and general budget, the scholarship budget, the auxillary enterprises budget, and the plant budget for the next ten years. As a result of these projections, conclusions regarding budget

---

[1] Seymour Harris, "Broad Issues in Financing," Financing Higher Education: 1960-70 (New York: McGraw-Hill, 1959), p. 35.

and tuition levels, faculty size, faculty salaries, student-teacher ratios, and faculty loads as well as some general conclusions regarding the character and quality of the university could be drawn.[2] Another educator, Hans J. Jenny actually took this procedure or outline and applied it with good results.[3]

An early but comprehensive analysis of management in higher education which sought to "present practical ways of effectively involving in management the high abilities of faculty, executives, president and board" was written in 1964 by Thad Hungate. He divided educational administration into four functions: delegating and organizing, directing, operating, and evaluating. This book is valuable in that irrefutable principles are enunciated, and some suggestions proferred, but it stops short of a concrete "nuts and bolts" approach.[4]

With regard to accounting and control techniques most universities have adopted the system prescribed by the American Council on Education.[5] "These principles, however, include significant options or permissible variations and alternatives of consequence that make possible quite diverse reflections of the financial operations of an institution."[6] Even within institutions there are a diversity of types of information systems varying in complexity, location and degree of duplication. The existence of two or

---

[2] Sidney Tickton, Needed: A Ten Year College Budget, (New York: The Fund for the Advancement of Education, 1961), p. 152.

[3] Hans Jenny, "Putting the 10 Year Budget in Practice," College and University Business, XXXVIII, No. 2, (February, 1965), pp. 35-40.

[4] Thad Hungate, Management in Higher Education, (New York: Columbia University, 1964).

[5] The National Committee on the Preparation of a Manual on College and University Business (Washington D. C.: American Council on Education, 1955).

[6] John Swanson, Westey Arden, and Homer Still, Financial Analysis of Current Operations of Colleges and Universities, (Ann Arbor: University of Michigan, 1966), p. 385.

three separate systems, the registrar's, the controller's, and the budget officer's, is not unknown or uncommon. There was and is a definite need for correlation and integration of all the information on a university-wide basis. The Swanson, Arden, and Still study was one of the first to attempt some systematic organization of the financial data of institutions of higher education.[7] The attempt was made in recognition of the rising need for transfer of the techniques of operations research and management science to the academic field, and the increasing need for strict classification and boundary delineation prior to any application of these evaluative methods. Reliable and consistent financial analysis were seen as capable of providing a means whereby the financial implications of present and proposed policies could be quickly measured. "Further, they should provide an evaluation of the actual operation of the institution in relation to institutional policies, clearly showing deviations from those policies and the financial results of such deviations."[8] Toward this end the authors proposed a general analytical procedure to isolate this information and provide it to management officials not only on an intrainstitutional basis but also with interinstitutional validity. The latter usage inferred some commonality of "the same body of data." The study, which was based on a survey of 110 institutions varying widely in size and type of control, concluded with an in-depth extension of the basic classification and definition suggested in College and University Business Administration.

This establishment of categories which cut across traditional and functional organizational boundaries was predicted on the assumptions of accrual accounting of income and expenses, inclusion within the total

---

[7] Ibid., p. 5.

[8] Swanson, Financial Analysis, p. 385.

university of almost any associated activity such as health or atheletic services, and allocation of utility expenses to a Plant Operations and Maintenance account. The vehicle for division of the university structure was conceived as five basic functions; Instruction, Research, Services to the Public, Services to the Academic Community, and General Support with analytical sub-categories within each area.[9] These basic divisions served for both the cost and income classifications. The major portion of the project dealt with the format and measurement of various activities as they fit into their respective categories. A large glossary of definitions utilized in the development of this classification scheme is included as well as numerous examples of sample data. The indices or measures computed from the raw data were basic costs, percentages of teaching loads with "unit costs" (total expenses of a unit divided by utilization factor) or average cost per equivalent student, staff, or faculty member.

The next phase in the development of efficient and uniform accounting systems for more efficient educational administration was tackled by an eight university group sponsored by the National Science Foundation and the National Institute of Health. Coordinated by Father R. J. Henle the project attempted to present the rationale for a suggested system, its main features, and some specific data judged necessary for implementation. The goal of a universally acceptable total information system with some degree of compatibility between institutions was accomplished in that a general outline and principles were established, pertinent activities identified and measured, and representative files outlined. The study stresses that any information system developed must be comparable and "these systems should fit into one totality of the scientific community and other comparable communities since

---

[9] Ibid., p. 49.

common data on these groups is needed for many purposes."[10] Although the project was directed toward development of a system with maximum efficiency and effectiveness, but not to the detriment or exclusion of sound educational theory,

> The system itself must be planned so as to subserve the needs of specialized institutional research insofar as possible. This means that the system must be comprehensive and basic, not dominated by limited objectives and not rigidly set by immediate purposes. The system must be potentially multi-purpose.[11]

Perhaps the most widely recognized section of the report is summarized in a fine conceptualization of total information systems, Figure 4. It is more than a mere data organization chart, "it expresses a philosophy of the organization of a university."[12] It relates the goals, resources and activities in a comprehensive framework. The categories or functioned areas established in zones 4, 5, and 6 will appear and reappear in most conceptual studies of the university as an economic model. The collection of "prime" or basic data is judged essential to compiling an information system. The use of comprehensive questionaires to obtain this unbiased data as a basis for file building is proposed. Once established, these data bases must be continually updated to insure their accuracy. By virtue of a common, comprehensive data base, duplication of systems is eliminated. The different types of complex or derived information needed for specific purposes by various departments can be developed accurately with a relatively simple program to manipulate the raw material files in a special manner.

The standard budgetary concept of translating resources into monetary terms and allocating them to the specific activities of the whole is

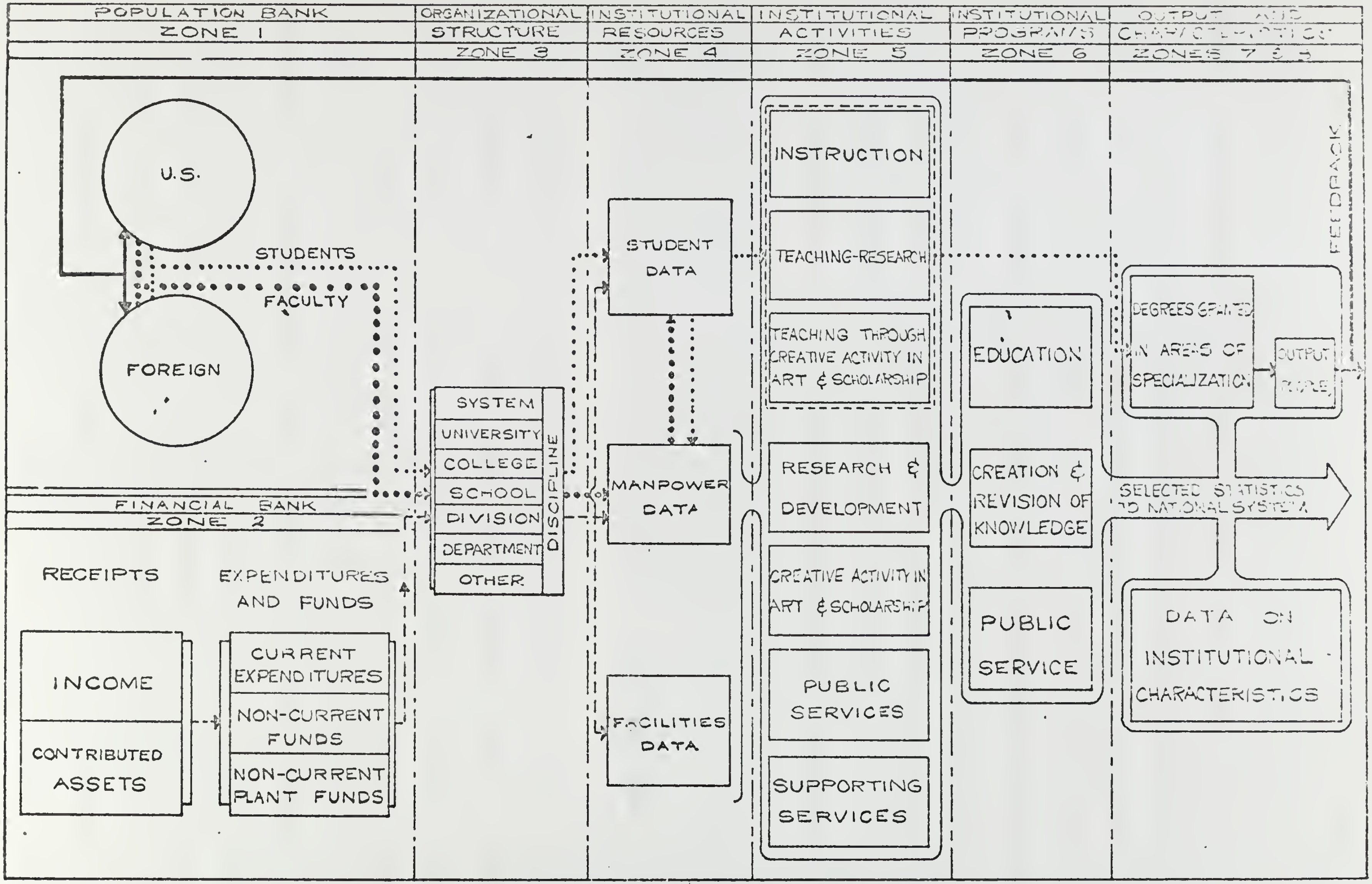
---

[10] R. J. Henle, Coordinator, Systems for Measuring and Reporting the Resources and Activities of Colleges and Universities, (Washington D. C. NSF 67-151, 1967), p. 3.

[11] Ibid., p. 14.

[12] Ibid., p. 17.

Chart 8-1. Data Organization[13]



---

[13] Ibid., p. 203.

incorporated, but with some peculiar nuances as to their definition and assignment. The description of an activity as a course of study leading to a degree is utilized, but is by no means a hard and fast classification. The assignment of faculty, time, space, etc., to various activities is based on the input data which must of necessity be monitored to avoid conscious or unconscious biases of the respondents. The particular methods of weighting research time and effort or the loads of dissertation and theses advisers are arbitrary and dependent on the objectives and policies of the universities. More often than not the data collected in this manner for financial or statistical analysis extends far beyond that necessary for purely accounting reporting and control purposes, and in some cases will not be strictly comparable because of different conceptual frameworks and boundaries. On a gross level,

> The resources used in carrying out institutional programs are identified as manpower, students, and facilities. The use of these resources to carry out various activities can be measured, at least to some extent, in monetary terms using the activity concept. This concept utilizes manpower, equipment, space and enrollment reports to distribute costs according to reporting activity.[14]

The increased importance that government grants to education must assume in future years demands the development of some at least roughly comparable system of classification and definition; if not total production efficiency and quality of product measurement. The reluctance of public officials to give institutions carte blanche with the taxpayer's money has promoted some progress in these directions. One of the most promising efforts, which has been championed by the Office of Education, is the Western Interstate Commission for Higher Education (WICHE). Originally founded as the regional effort of 13 western states, WICHE has produced carefully planned series of classification systems, University models, and cost-benefit programs

---

[14] Henle, Systems, p. 193.

notable in a field characterized by fragmented efforts. The objectives of this organization are enunciated as being:

1. To design, develop, and implement management information systems and data bases including common data elements at local and state levels including community colleges . . . which will improve the capability of these institutions and agencies to more effectively allocate resources, and provide them on a continuing basis with comparable data on the cost of institutional programs by level of student, level of course, and field of study.

2. To begin the task of identifying institutional input-output indicators for instructional, research, and extension service programs, both qualitatively and quantitatively, and relating varying educational costs to such indicators.

3. To conduct an educational program including instructional and seminars on systems analysis, operations research, program budgeting, cost-benefit analysis, and the use of simulation models in training top administrators in the use of these tools in decision-making.

4. To coordinate this regional effort with other regions and at the national level.

5. To coordinate the exchange of comparable data among cooperating institutions in the West.

With the increased support of the government and national support of interested educators, WICHE is assuming more and more of a leadership role in education systems development. Their efforts have been excellent compilations and extensions of other work in the systems analysis field.

One of the best, and coincidently the shortest, contributions to the field of operational university planning and control was Harry William's

book, Planning for Effective Resource Allocation in Universities.[15] He adapts the Department of Defense techniques of program budgeting to the educational experience. In addition to some definite guidelines as to program classifications and sub-categories, he demonstrates the applicability of techniques such as the decision matrix and cost-benefit analysis to evaluation of alternative educational programs. This book was the key that unlocked the door for a whole series of studies in which practitioners have taken the principles and techniques and translated them into specific systems and actual implementation. One of the first attempts with this orientation was a study funded by the National Science Foundation, University Cost Structure and Behavior which utilized the historical data of Tulane University,[16] to produce some basic models for planning expenditure levels based on varying enrollment and faculty salary assumptions. In this model considerable detail is proferred including a Fortran Program for use in implementing the model on other data bases.

The Tulane study operates on the broad outline of the theory of the firm in that raw material (the new student) is transformed into a finished product (a "better educated" student). The physical assets of the university are "the factors of production," that have been employed to achieve this end. These factors are recognized in the university accounting system as manpower, materials and supplies, acquired services, and buildings and equipment. They agree with Harry Williams and the Henle study that these inputs are the sum of all resources available to the university.[17] Classification of expenses

---

[15] Harry Williams, Planning for Effective Resource Allocation in Universities, (Washington: American Council on Education, 1966), for more extensive discussion see following.

[16] John Firman, University Cost Structure and Behavior, (Washington, D. C.: National Science Foundation C-451, 1967).

[17] Firman, 14.

may vary only in the degree of sophistication and detail required or desired. Messers Swanson, Arden and Still postulated a more intricate system consisting of primary classification (function or category), secondary classification, (source) and an identifying mechanism or number. For example, the instruction function is further divided into organized teaching of degree credit courses, supported by tuition fees earned by a specific activity.[18] The Tulane study opted for a somewhat similar system based on the premise that most universities could not identify their imputs to that extent at the initial stages. They utilize the more conventional "natural cost classifications" of Personal Payments, Expense, and Equipment existent in virtually all university accounting systems. In this system we find the major categories defined as job titles such as "Professors salaries and sub classified by functional areas such as academic instruction, research, administration."

On the output side, the multifaceted aspects of the "intellectual growth" product have been examined by Kershaw and McKean as to the quantification of concepts like learning in specific subjects, development of social maturity, and improvement of ability to reason creatively.[19] The important fact to remember is that the student per se is not an imput or output but a participant or vehicle in the process. The artificial construction of the "trained" student as output is merely that, a substitute. The conventional measure of student credit hours produced or students graduated lends itself readily to manipulation and distortion. The output of the auxillary and supporting university subsystems is similarly described by the terms of a student reference; i.e. students fed, housed, or cared for.

---

[18] Swanson, et al, p. 392

[19] James Kershaw and Roland N. McKean, Systems Analysis and Education, (Santa Monica: The Rand Corporation, 1959), p. 8.

Having decided on their desired imputs and outputs, the Tulane study encountered some difficulty in defining the transformation process. The problem of establishing the rate at which professional knowledge units are utilized to produce a unit of student knowledge looms ominously. The equivalencies or trade-off rates of personal instruction versus lecture or seminar instruction are unknowns. The number of units of professional knowledge generated by an instructor versus a full professor is another example of the vagaries inherent in the model. The fact that some of the factors of production actually increase in value instead of being exhausted in the operation of creating student knowledge stands in direct contrast to the business experience as typified by the theory of the firm.

Harry William's proposal to impute a value to the entering student based on an actuarally determined and discounted present value of the stream of his future earnings would appear to offer some relief as to the valuation of the true outputs of the educational process. If the same measurement of earnings were applied to all human factors within the system, the differences between the entering and exit values could be taken to represent the value of the university's product in monetary terms. Unfortunately, the student as the vehicle or participant is not a true constant. The intellectual capability of the individual student can cause large swings in any entrance/exit measurements. A possibility for better quantification would seem to exist in universities which maintain a definite admissions standard, but the social impact of this rationing has diminished the viability of this control. Still, student profiles on imput and output (rarely done) would be one reasonable effort to measure the benefits of education. Alternatively, one author states:

> The measurement of the products of institutions of higher learning involve a qualitative judgement on the value or success of the services performed. Unfortunately, in the field of higher education, the development of measures of such success has not proceeded to a point even approaching the possibility of universal or widespread agreement. It is therefore,

> extremely difficult and extremely dangerous to try to relate a financial analysis to the 'products' of an institution of higher learning when these products can not be clearly defined, let alone given any sort of quantitative measure. To attempt to do so would leave this study open to the charge that such quantitative financial analyses are dangerous and useless because they imply that quality can be measured in such terms. . . . A measurement of quality in education of the present time is a highly subjective matter.[20]

On this basis one might despair of going forward with any study or analysis. I would disagree and propose that even the admittedly deficit measurements of credit hours or whatever can be used to establish relative figures, and it is the responsibility of the decision-maker to recognize the deficiencies of this measuring system in arriving at a final decision.

An excellent article on this area of measuring effectiveness and performance has been written by John Keller, Director of the University of California Office of Analytical Studies. He focused on the narrow area of instructional output and proposed a value added approach, "the number of imputed units (students) which become final products by virtue of having accumulated some specified minimum number of effectiveness measures."[21] Recognizing the pitfalls of quality measures, he still maintains that the "completers" can be counted and weighted with an index of quality in relation to their peers not only at that institution, but also other similar schools. Some of the immediate qualitative criteria used in ranking the product might be test scores, awards, and personality inventories. In the long range evaluation of macro economic qualities some of the following proxies were considered promising: first offered wage, cumulative income (5, 10, 15 years), proportion into management level positions, number of papers published in scholarly or technical journals, rate of election to select professional groups and posts, drunkenness, arrest, and divorce rates, and magazine and book

---

[20] Swanson, Financial Analysis, p. 27.

[21] John Keller, "Higher Education Objective: Measures of Performance and Effectiveness," (University of California, unpublished draft, 1969), pp. 14-16.

reading frequencies, to name only a few.[22] This system of measurement would assume that the school had failed if they had not obtained some degree of commitment from the student as to the alignment of his objectives with those of the school. The maverick student who may profit greatly by the educational process, but whose goals are not in accord with those of the university would penalize the particular field of study or school under this rating system.

As to an efficiency measurement, both total cost and total benefits must be compared. By total costs is meant the opportunity costs and overhead-type costs added to a program by attrition prior to completion. The relative hierarchy of benefits by field of study or program was recognized as a gray area. The proposed system with its acknowledged rough measure and shortcomings and limitations envisioned:

1. Institutions ranking objectives by weighting the various measures of benefit.
2. Development of a ten or fifteen institutional peer group with similar quality weighted indices.
3. The institutions would collect an agreed upon body of defined costs, perhaps on a random sampling of alumni basis.
4. Compare "success" of the graduates with the institution's value index and the cost incurred.[23]

The value of these analyses would be that institutions whose costs were out of line would seek to remedy the situation by regulating the high annual costs per student, high attrition rates, inadequate curricula or standards, non-standard or incomparable student input as a result of a conscious admissions policy. An excellent theoretical system, but the cost of

---

[22] Ibid., p. 7.

[23] Ibid., p. 14-16.

development and implementation might prove to outweigh the benefit accrued by most institutions at this stage of information systems installation and implementation.

The initial Tulane total systems simulation model was further developed and expanded by another National Science Foundation grant to formulate a totally integrated system for university planning purposes.[24] In this study the resources of the university are described in the familiar quantifiable terms of personnel space, and equipment.

> The university is viewed as a multivariable dynamic process with manpower and physical facilities as input and with developed manpower, community service, and research as output. . . . The model itself identifies a functional structure and within this functional structure establishes an accounting system which delineates both the quality and unit cost of the inputs and outputs associated with each sector of the university. No attempts are made to establish what are the 'right' goals of this planning or establish measure of quality.[25]

The major sub systems or sectors of the model are seen as students, production (academic and non-academic), resources (personnel and physical), see Figure 5. The student sector is a description of the university system in terms of distribution of students among various levels and fields of education and the associated unit costs or inputed values received. The output of this sub system, demands for course credits and research teaching, are inputs to specific areas of the curriculum encompassed by the production sector. The combination of faculty effort, graduate assistant effort, and support facilities are channeled to meet these needs, and additionally, to produce some output not consumed within the university structure, governmental research, public service programs, and a variety of other services. The inputs of personnel effort and environmental or support facilities are generated by another sector, the

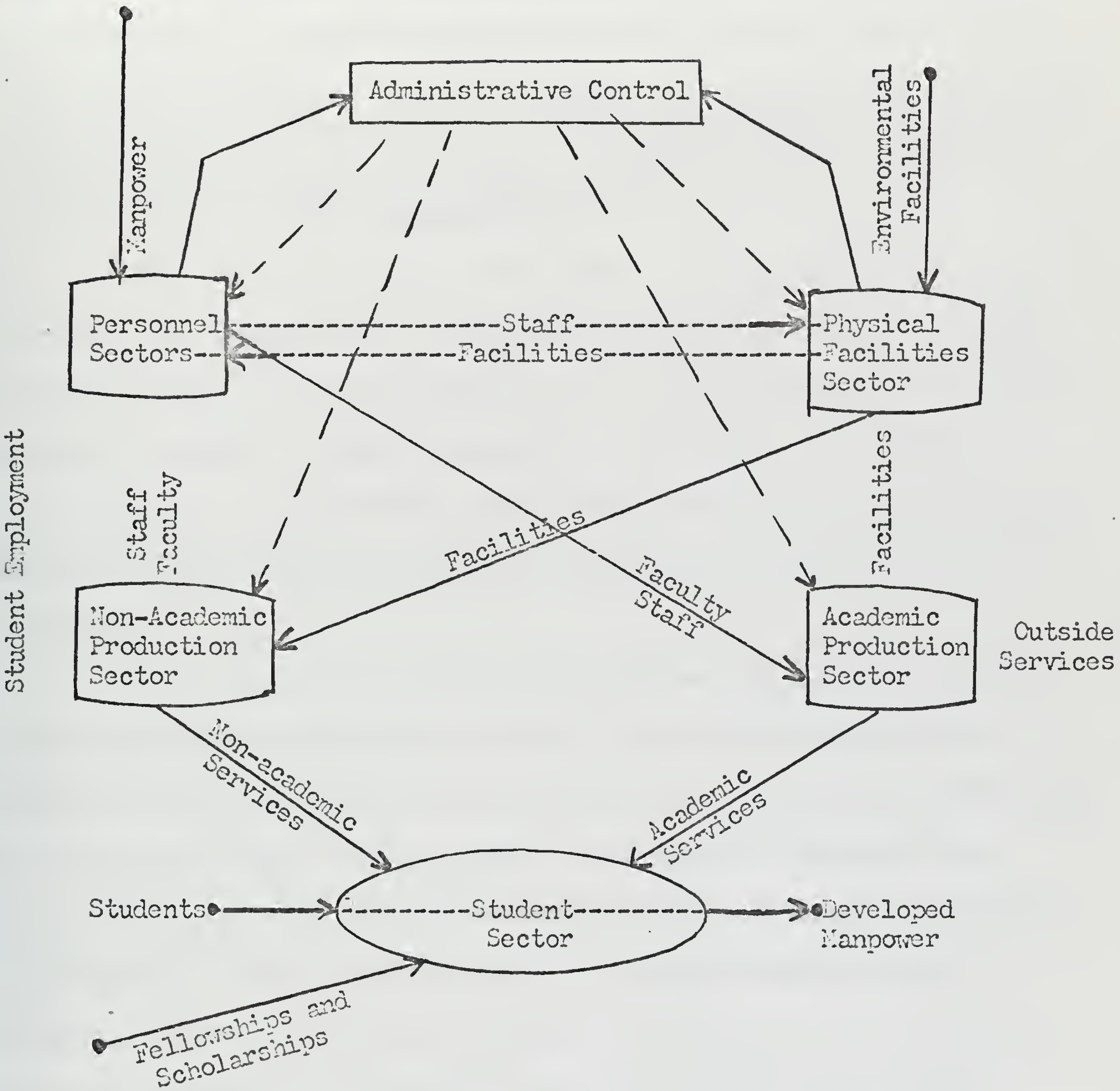
---

[24] H. E. Koenig, M. G. Keeney and R. Zemach, A Systems Model for Management, Planning and Resource Allocation in Institutions of Higher Learning, (Washington, D. C.: NSFC-518, 1968).

[25] Ibid., p. 7.

FIGURE 5

STRUCTURE OF THE SYSTEM MODEL[26]



---

[26] Koenig, et al., A Systems Model, p. 44.

resources sub system. It is the function of this system to develop and distribute the raw manpower, plant, and equipment to meet the input requirements of the production sector which is ultimately a function of the student sector. One of the more interesting constraints included in the total system description concerns the composition of the student body.

> The number of graduate assistants employed by the university is related to the undergraduate enrollment distribution through the demand for undergraduate course credit hours. On the other hand, the enrollment distribution, at least at the graduate levels, depends in part on the availability of these assistantships.[27]

This is typical of the equations which compose the model and describe what is actually an interdependent or circular relationship. All this is intuitively plausible and simple logically, but the actual mathematica and determination of specific variables, parameters, and linear relationships is fairly complex. Some forty-five basic variable statements or equations, and twenty-five policy decision matrices are utilized in the development of the model proper.

Having examined some of the representative efforts in the general areas of educational planning and control, one can not move on without looking at the budget itself as an instrument which combines both functions. "In a procedural sense, the only factor which makes for internal unity within the present day university or even the larger liberal arts colleges is the budget."[28] The specific concept of "program budgeting" will be emphasized because of the greater visibility it affords to the component elements or programs. The unifying nature of the budget has long been recognized,

> It is the essence of decision making to choose alternative ends and to ration scarce means to their accomplishment. At this level of

---

[27] Ibid., p. 425.

[28] John D. Millet, Financing Higher Education in the United States, (New York: Columbia University Press, 1952), p. 226.

> decision making no significant distinction exists between profit and non profit organizations or between Private and Public organizations. All require the ordering of goals, the analysis of their relative contributions to the aims of the total undertaking, the development of plans, the measurement of alternative resource inputs and their relation to progress toward objectives, rational choice of feasible ends, allocation of means, monitoring of progress, and appraisal of results. The budget process is the activity through which this work is done. The budget is the instrument through which the process is made operational.[29]

Harry Williams, as has been previously mentioned, has been one of the leaders in translating the governmental concept into the academic applications. He advocated program budgeting as an approach to creative management not merely the use of a formula. The primary rationale for this procedure is that by drawing attention to the choices available between or among various programs, which should in turn be descriptive of specific areas contributing to the production of knowledge, various analyses are inherent.

> The commercial enterprise receives an aggregate signal from the market through a comparison between its revenues and its expenditures. The university lacks this measure; profit does not provide external and impersonal evaluation of its activities, the college and university must substitute analytical studies of its activities, their direction and level for the forces of the market place.[30]

He visualizes a hierarchy whereby the long range purposes or objectives of the university are translated into strategies or plans which are segmented into major intermediate range programs, from which in turn the annual program budget is derived. The problem of conceptualizing, formulating, and weighing alternative programs is a responsibility of all levels of the management chain.

The techniques available for arriving at some quantifiable comparison of alternative programs are viewed as limited only by the sophistication of the users, but a simple linear programing approach is illustrated,

---

[29] M. Anshen, *The Federal Budget as an Instrument for Analysis, Planning and Management*, (Santa Monica: The Rand Corporation, 1965), p. 1.

[30] Williams, *Planning for Effective Resource Allocation*, p. 12.

Figure (6). Here the institution is comparing two programs, A and B, against how well they satisfy five criteria which are weighed as to their relative contribution to the university's goals. Each program is evaluated as to the extent it satisfies the individual criteria (0-100%). This score is weighted by the institution's judgement of the relative contribution of the criteria and totaled. The B program satisfies the objectives of the university to a greater extent (46% versus 25%) but its costs are far greater. The cost effectiveness ratio shows that program A provides the same accomplishment for lower cost, but this is not necessarily the whole story. The manager must now decide whether program B is worth the extra cost involved, and also whether the relationships between A and B would hold true over the long run--would three times the investment in A increase its benefits by a factor of three? The information is clearly quantified and the manager can make his decision.

Williams concludes that program budgeting:

1. Does not preclude existing structures.
2. Can relate resources to teaching, research, and public service in a meaningful way.
3. Should derive annual budgets from extended year programs which are derived from long range university-wide plans.
4. Provides for a periodic appraisal of each element in the planning, programing, and budgeting cycle.
5. May require a full time analytical staff.
6. Provides to intra (and possibly inter) university comparisons.
7. Is in direct contrast to present incremental budgets which provide only for legal accounting of funds with no provision for decision-making.[31]

---

[31] Ibid., p. 69.

FIGURE 6

COST EFFECTIVENESS CALCULATION[32]

Criterion		1	2	3	4	5	Σ	Total Program Costs	Cost Effectiveness Ratio
Relative Importance		.10	.15	.20	.50	.05	1.00		(000's)
Program	Score Type								
A	Raw	.60	.70	.10	.10	.30			
	Weighted	.06	.105	.02	.05	.015	.250	50,000	200.00
B	Raw	.30	.40	.50	.50	.40			
	Weighted	.03	.06	.10	.25	.06	.46	150,000	326.00

---

[32] Williams, Planning, p. 64.

The problems raised by this approach are not insurmountable but only occasions for caution:

1. The cult of narrow-minded economic efficiency may overrule academic quality.

2. The costs of implementing may be greater than the magnitude of the decision involved.

An excellent example of the progress and practical implementation of these program principles is the experience of the University of California system. California has taken the lead in attempting to quantify an increasing portion of its fiscal operations. As early as 1951, the Department of Finance and the Division of Organization and Cost Control were established as watch-dog agencies under the strong executive control of the governor to promote efficiency and effectiveness in state government. The rapid growth of public higher education had raised some problems as to the validity of comparing widely dissimilar colleges and universities on the basis of the student-faculty ratio. In a search for some rationality and objectivity in the process of budgetory allocation, a state-wide survey was initiated to develop a Faculty Staffing Formula. The result of this study, the Chandler Report, was a new system of salary budgeting "based upon a calculation of the total amount of college instructional work . . . which a faculty member can reasonably accomplish."[33] This was not an absolute figure, but the result of a formula based on institutional characteristics and the type of assignment. This formula which related the student credit hours to the number of faculty, course by course, was very comprehensive in that subject areas were further subdivided into types of courses and teaching methods used including section size. The assignment of faculty, and the state salary appropriation levels,

---

[33] California Department of Education, "The Faculty Staffing Formula of California State Colleges," (Mimeograph, January 1957.)

were based on this common equation. The extensive detail required and the problem of firm forecasts of student demand in terms of courses and class sizes were the obvious shortcomings of this system, but the focusing on a quantitative measure of the proposed impact of the funds was an improvement over the arbitrary student-teacher ratio.

Although this formula and other like methods of comparison, ratios of library staff to workload, books to students, etc., were improved and updated the real basis of the budget was incremental despite the objective analysis of various areas. Finally a study oriented toward the implementation of a program budget, and emphasing efficient resource allocation, information control and decision systems was commissioned.[34] The reports and studies published as a result of this study are too numerous to list in their entirety, but some pertinent to current operations are: Undergraduate Student Enrollment Forecasts - R. Olivi, The Stability of Faculty Imput Coefficients in Linear Workload Models of the University of California - D. Breneman, and Expansion of University Faculties to Accomodate Increasing Enrollment - R. Sanderson.

From studies of this type, a ten year program budget format was developed, and a system (Academic Program Summary Review and Analysis) established whereby individual campuses and colleges could submit their budget requests. This was both an instructional and functional system in that sufficient details and explanations were offered so that even the unfamiliar administrator could frame his request in the program form. The major program areas were viewed as Instruction, Sponsored Research, Public Service, Libraries, University Administration, and Supporting Services.

> Although each major program is necessary to produce the outputs of the university, no one in itself is sufficient to satisfy fully and

---

[34] Charles Hitch and F. E. Balderston, "Report of Program of Research in University Administration," (Berkley: University of California, 1969), The Research Report No. 69-13.

> efficiently the totality of these goals. Therefore, the analytical and managerial process for maximizing the effectiveness of the university requires a thorough understanding of the interactions among the programs as well as the costs and attributes of each of the programs. Vital to such an analysis is the consideration of the marginal costs and benefits of the many elements within each of the programs and the trade-offs among the major programs.[35]

The benefits of the major programs of Instruction, Research, and Public Service were measured by the use of proxies such as degrees granted, dollar values and gross number of research projects, and number of people served or volume of attendance. These were not proposed as ideal measures but were utilized with the recognition of their individual weaknesses or biases. Examinations of this type have illustrated several heretofore unknown effects and influences. In the Instruction program, the effect of the attrition rate on the cost-per-degree granted is being studied as an area for both reducing the attrition and measuring the benefits accrued by the students who do not finish. Also the cost-per-degree is affected by the degree and extent to which a student takes electives in a wide variety of areas which is in turn a function of the diversity of the university's offerings. Marginal analyses performed illuminated the fact that increased student financial aid may be more productive in decreasing attrition (and lowering cost-per-degree) than other types of actions.

In the Research program the university has launched studies to determine the spill-over effect that the development of research institutes has on increasing the quality and decreasing the direct cost of graduate education. An additional aspect of this program is the high quality instruction that research projects attract to the university, and the multiplier effect which seed projects have on the attraction of further grants.

---

[35] The University of California, A Program Budget: FY 1970-71--FY 1973-74, (Berkley: University of California, Mimeograph, 1969), p. 2.

> The university creates a wealth of knowledge, problem solving resources, and cultural activities in the process of fulfilling its other programs. Public Service is the program by which the university shares many of these benefits with the many segments of society beyond the university community.[36]

The inclusion of the university extension service in this program may seem incongruous but the demand for this service even on a full cost basis is indicative of an unfulfilled need. The sheer numbers of the projects per staff and an increasing demand for the agricultural, health, and urban services is viewed as an acceptable proxy for the true benefits of crops saved, lives improved, and social unrest prevented.

The supporting programs of Libraries, Administration, and Supporting Services have benefits which are consummed within the university. The surrogate measures employed are volume of circulation, percentage of total university expenditures, and numbers of student/faculty served. Any analysis of the increased efficiency and effectiveness in these areas must also be examined as to its effect on the primary programs and their products. Additionally, the individual elements within each program must be examined with regard to their position or contribution to the concept of the university as a member of the community.

This installation of a program budget by the second largest university system in the country is truly a landmark advance in promoting both a testing and development ground. The extent of progress has been clearly delineated, and a ambitious plan for greater improvements, particularly in the areas of benefit measurement proposed. The university stands as living proof that these techniques are not just wishful thinking on the part of theoreticians.

---

[36] *Ibid.*, p. 26.

CHAPTER IV

CURRENT OPERATIONS AT THE GEORGE WASHINGTON UNIVERSITY

The preceding chapters have explored the techniques and theories prevalent in the fields of business, the military, public administration, and education as they relate to effective planning and control systems. Most of the studies in the latter area have been designed by and for a specific college and university.[1] It is interesting to note that both Michigan and California are large publicly supported universities dependent upon state funding for their operating budgets. It is the purpose of this chapter to see how and to what degree these prototype studies have spread and been translated into practice by a private university. It is not advanced that George Washington University is necessarily representative or typical of a segment of the nation's institutions of higher learning. The George Washington case is peculiar in that the school is located in a large metropolitan center characterized by a predominantly graduate enrollment, and is unusually dependent on tuition income for funds. Nevertheless the ways in which and the extent to which the best models of sound practice have been adopted should serve to illustrate the viability and universality of application attached to these various theories.

George Washington's financial history is somewhat checkered. Luther Rice, the founder of Columbian College (presently the undergraduate liberal

---

[1] The Tulane study described in University Cost Structure and Behavior only used that university's data for deriving their model. The actual model was not implemented by the school.

arts department of the university), started the university on a shoestring raising a majority of the initial funds himself. As Treasurer and Trustee, Rice's complete ineptitude as an accountant and money manager left financial affairs in a hopeless mess. So tangled was the situation that he was charged with malfeasance by a recent graduate and fellow trustee who insisted on publicizing the sorry fiscal picture. The end result was that the college was forced to close its doors for a time in the late 1820's for lack of funds. Fortunately, the college was able to attract some generous financial donors who advanced enough money to reopen the school, and Rice was persuaded to step down as treasurer leaving the job in presumably more capable hands. However the university was not out of the financial woods, but existed on almost a hand to-mouth basis through the Civil War period despite being made the beneficiary of George Washington's gift of fifty shares in a company formed to exploit the navigability of the Potomac river. The absence of heavy present day commercial traffic is mute evidence as to the tangible value of this bequest. The university eventually derived its present name from a George Washington association that donated almost a quarter of a million dollars to the university. The reputation for shaky financial management continued to haunt the school, and in 1910 the Attorney General was asked to conduct an investigation into the management of the university's funds by the House of Representatives.[2]

The recent heavily publicized hiring freeze and admissions that the university was running a deficit in their operating budget would seem to indicate that this is merely another example of history repeating itself.[3] Fortunately this is not the case. As indicated earlier, all colleges and universities almost without exception are caught in a money squeeze by rising

---

[2] E. L. Kayser, Bricks Without Straw, (New York: Appleton-Century-Crofts, 1970).

[3] Washington Post, November 23, 1970.

prices and burgeoning enrollments. By virtue of its heavily tuition-dependent position The George Washington University should have been hit harder than most. It is to their credit that they were able to recognize their situation and, as will be demonstrated, chart a course for a sound future. The peculiarity of university's income position must be fully appreciated.[4] There is no endowment income to absorb unexpected developments. The demand for a George Washington education as reflected by enrollment predominates any discussion of the university's plans. Competing in a market with public-supported or endowed private institutions, its survival is dependent on offering a quality product at an attractive price. The only way this can be achieved short of federal support is by rigorously efficient financial management. There is no room for slippage or waste in such an organization. What is being done toward this end at George Washington?

In examining the formalized planning system of George Washington, the existence of a designated committee for planning is notably absent. According to one study based on a sampling of large state universities across the country, forty-five percent of the sample had a designated office of institutional research.[5] Although this sample is tainted by the more stringent and regimented structural responsibility dictated by state legislatures, the definite assignment of the planning responsibility and function to a specific body is seen as one method of insuring its organized execution. At George Washington this function appears to be centered in the office of the President with his Budget

---

[4] Excluding Medical Center Operations, from 75 to 90 percent of the University's disposable income was generated by student fees. Endowment constituted less than 1 percent! The variation in the tuition percentage is a result of different interpretations of financial statement items such as the breakeven auxillary enterprises and federal research grants.

[5] R. Axt and H. Sprague (ed.), *College Self Study*, *Lectures on Institutional Research*, (Boulder: Western Interstate Commission for Higher Education, 1959), p. 47.

Officer as the chief planner. The Budget Office is directly responsible to the President, not the Treasurer and Financial Vice President. The President has evaluated the feasibility of designating a special planning commission, but has decided to centralize the planning responsibility and authority in his Budget Office. This decision to retain the planning function was based at least partially on experience with similar committees which bogged down into battles between various "vested interests."[6] This lack of formal structure has been overcome by an excellent informal working relationship that has been maintained between the Academic Vice President, the Financial Vice President, and the Budget Officer. The extensive applied statistics background of the Academic Vice President has helped to bridge the traditional gap between the academic and business sections of the university. The informal troika arrangement with the President in direct communication has been reasonably successful.

The results of this cooperative arrangement can be seen as a Campus Master Plan issued by the Financial Vice President and revised on an as needed basis, and a rolling four year budget projection of expenses broken out by departments. The Campus Master Plan deals mainly with the broad physical facility objectives for a period in excess of twenty years into the future. It is divided into three phases; phase one covering the construction of buildings for immediate needs for which sites are presently available, phase two outlines those facilities which will be required in the 1975-1980 time frame, and phase three consists of all requirements beyond 1980.[7] This plan is based on a recognized need to expand the educational facilities (Science Building, Medical Library, and Fine Arts Center), the support facilities

---

[6] William Johnson, interview, Washington, D. C., March 19, 1971.

[7] Henry Herzog, 1970 Report of the Treasurer (Washington D. C.: George Washington University, September, 1970), p. 6.

(Parking Garage, Administrative Office Building), and odd investment or income properties. This latter classification is based on the requirement for a steady endowment-like income and the strategic location of university owned land in the heart of the metropolitan area. This is a sound concept and should provide a welcome addition to future operating income. The university has decided that the future physical plant will be limited to a definite area and has no plans for expansion beyond this finite limit. This limit has been roughly translated into a student enrollment level limit of from 15,000 to 17,000 dependent upon the mix of undergraduate and graduate, resident and non-resident, and on campus and off campus students. No space allocation or facilities utilization study has been developed or projected in conjunction with these mixes and the physical constraints.

Turning to the only costed plan of the University, the Four Year Budget projection is developed by the Budget Office as a line item, incremental budget and circulated to the individual department chairmen and deans with specific guidelines. The department heads then suggest salary and personnel levels and return this portion to the Academic Vice President who generally arbitrates any disagreements. The Budget Office, in close cooperation with the Admissions Office develops projections of expected enrollment based on applications levels prior to final submission of the budget to the board. This estimate is done without regard to any hard and fast formula, but is based on the subjective judgements of the two offices. The process of yearly review and update by the department heads allows them to see their expected budget for three years prior to its execution and implementation, allowing ample opportunity for negotiations and revisions.[8]

---

[8] Ibid., p. 6.

As outlined above, the present system has no provision for comparison of projected income with projected expenses on a departmental basis. The only analysis of this type is done by the Budget Office on a total university level with an eye toward presenting a balanced budget to the board. However, an effort to make this analysis of sources and uses of funds on a departmental level is presently close to fruition. The University has been given a Ford Foundation grant to establish a system of program budgeting.[9] In implementing this study the University decided to broaden participation to the Consortium of Universities in the District of Columbia. This association of the five major universities in the District of Columbia: George Washington, American University, Howard University, Georgetown University, and Catholic University has been formed in an attempt to face the economic realities of education in the urban area to the exclusion of parochial interests by an interchange of information and possible common use of facilities.

The development of a program budget or indeed any plan demands that firm quantifiable objectives be established. This has not been done at George Washington. Again the problem of "vested interests" and the difficulty in gaining accord are cited as the reasons behind this failure.[10] The major objective of George Washington as outlined in the preface to its study of program budgeting is,

> To provide the most education (qualitatively and quantitatively) for each dollar spent. This applies both to dollars spent by the institution for program costs incurred and the dollars spent by students in purchasing educational services.[11]

Nevertheless, the study does recognize the necessity for delineating all the

---

[9] Ford Foundation Grant No. 690-0224 for $163,000.

[10] William Johnson, interview.

[11] Annual Report of Project to Establish Program Budgeting at George Washington University, (Washington, D. C.: George Washington University, March, 1970), p. 5, mimeograph.

costs and income produced by every program. In an effort to accomplish this, the group undertook to extract from historical data the costs and revenues generated by each department. The program classifications scheme chosen was based on Harry Williams suggested classifications and those formulated under the WICHE project. The rationale behind the selection of program categories that corresponded fairly closely to existing departments was to increase acceptance and ease of data gathering. No attempt has been made to try to quantify the benefits of these various programs, but a study of their cost-income relationship rather than a true cost benefit analysis is proposed because of the importance of tuition income to the University and the difficulties involved in quantifying outputs and benefits.

The result of this first effort to find out where the money had been spent and where it came from in previous years was compiled to yield a net gain or loss figure for each instructional program. This was obtained by balancing Resource Income against the Direct and Indirect Expenses applicable to each program, see Figure 7. The Sources of Income included Tuition, Instruction Provided Other Program Majors, and Designated Funds such as gifts, endowment income and sponsored research grants. Tuition was calculated by multiplying credit hours of instruction per program by the average university-wide tuition rate per credit hour. Deducted from this figure were Indirect Expenses (General Administration, Operation and Maintenance, of Plant, Library, Student Activities, Student Aid, and Capital Charges) based on percentages of the tuition dollar, and Instruction Provided By Other Departments based on the number of tuition credit hours. The addition of Designated Funds yielded a figure for Net Resources. Direct Expenses were totaled from the Department Budget, Special Projects, Summer School, Staff Benefits, Plant Space, Classroom Use and Sponsored Research. The net loss

FIGURE 7

RESOURCES AND EXPENSES[12]

1969-70

Preliminary Data for Discussion Only

Resources:			
General Funds			
Tuition: Program Majors	(977 CrHr)	60,848	
Lower Division	(2205 CrHr)	137,327	
Division of University Students	(315 CrHr)	19,618	
Summer Sessions	(493 CrHr)	29,434	
		247,227	
Less Indirect Expenses (Per Exhibit B)		92,617	154,610
Instruction to other Program Majors	(648 CrHr)	92,779	
Instruction provided by other Departments	(315 CrHr)	46,349	46,430
Course Fees			12,576
Net General Funds			213,616
Designated Funds			
Endowment Income		3,764	
Gifts and Grants		24,401	
Sponsored Research		74,955	103,120
Net Resources			316,736
Direct Expense:			
Instruction	(4343 CrHr)		
Departmental Budget		310,873	
Special Projects		17,686	
Summer School		17,714	346,273
Staff Benefits		26,414	
Departmental Space		66,089	
Classroom Use		4,932	97,435
Sponsored Research			74,955
Total Direct Expense			518,663

---

[12] *Annual Report of Program Budgeting Project*, (Washington, D. C.: The George Washington University, March, 1971), Mimeograph.

or gain figure derived was indicative of the contributory or non-contributory status of that particular program. Indirect Costs were further broken down by programs, by category, to enable the departments to see exactly how much they were being assessed for Library use, etc. The practical use to which the individual department heads will be able to put the above information is uncertain. The level of financial sophistication varies widely with departments, but the implication that the department is going to be judged on a cost _and_ income basis is expected to generate interest. The report concludes that these figures should serve as "a means to induce participants to ask meaningful questions concerning the allocation of resources rather than to present themselves as ad hoc users of resources."[13] As a result of this illumination of the sources and uses of university funds, several possible strategies are being examined, the possibility of enlarging the off campus graduate program in an effort to cut plant costs for some programs, a consolidation of courses within a program, and greater use of the Consortium's facilities on a common basis. On a departmental level, it is envisioned that the income-cost study will motivate the chairmen and deans to generate realistic objectives as the foci for their proposed programs, and institute formalized financial planning on their administrative level. In a similar vein, a faculty staffing study has been initiated in order to force the program directors (department heads) to examine their faculty requirements on a long range basis and investigate the ramifications of eliminating positions by attrition, filling some posts with instructors or graduates assistants, and/or greater utilization of the part-time faculty resources readily available in

---

[13] The George Washington University Program Budget Advisory Board, unpublished comments quoting from H. Williams, _op. cit._, p. 39.

the Washington area.[14] This manpower planning study is viewed as the start of a more comprehensive model of the university.

Under this same Ford grant, Guy Black, Professor of Economics at George Washington University, has presented two useful papers. The first is a basic financial model of the university which is based upon the theory of the firm. The direction of this paper is wholly theoretical consideration of the university as an economic unit in which tuition levels are the primary determinant of demand. "A demand function for education establishes an upper limit to the number of students which will be obtained at any given tuition, and the number is lower for higher tuitions."[15] He goes on to translate this demand curve into a total revenue curve. When viewed in conjunction with an upward sloping total cost curve this establishes certain levels of enrollment and tuition which fall within the "limits of financial viability" (breakeven points). He further hypothesizes that similar curves can be established for total social benefit and total social costs with like results. The implications of this model are that two different programs such as engineering and law can be examined, the optimum tuition for each determined, and hence the most desirable enrollment mix. Possible conclusions as to pricing policies, interprogram transfer of funds, and differentiated tuition levels are offered as well as the observation that the extension of the model to more complex, multiprogram situations and the examination of problems such as the trade-offs between education services and research within the university is purely a technical problem.

---

[14] The preceding observations and information on the George Washington University planning and budgeting cycle draw heavily on interviews with William Johnson and supplementary materials furnished by his office.

[15] Guy Black, "The Basic Financial Model of the University," Appendix A, Annual Report to Establish Program Budgeting at George Washington University, (Washington, D. C.: George Washington University, March, 1970), p. 5.

In a second paper, Professor Black seeks to quantify some of these theoretical curves proposed in his university model.

> The planning, programing and budgeting approach to financial management depends critically on analytical methods such as cost-benefit and cost-effectiveness analysis. An essential ingredient in such methods is some means of determining how cost varies with variation in program characteristics . . . this paper quantifies cost functions of the types that would be used with such models in combination with parallel information on benefits or yields from education.[16]

This quantitative model of various engineering programs studies the effects of different program characteristics on costs. The study reveals some interesting economies and diseconomies of scale and the advantages and disadvantages cost-wise of offering only an electrical engineering curriculum; an electrical and mechanical program; or electrical, civil, and mechanical engineering as part of a general university. The parameters utilized were taken from representative practices regarding class and teaching loads, hours of availability per week, and the American Association of University Professors' scales and recommendations. The results or outputs were seen in varying levels of faculty requirements (or cost) under differently structured programs and enrollments. Some of the conclusions drawn were: "Below 1200 students . . . it would appear that faculty requirements alone would make undergraduate engineering education impossibly expensive;" and "the most practical (way of reducing costs) for small programs is for engineering education to be associated with a general university."[17]

Unfortunately these models have not been utilized by University planners at George Washington in their actual planning. The background work would appear to have been done and the next, and most important, phase is to actually apply this research in the planning and budgeting process. The

---

[16] Guy Black, "On the Cost of Engineering Education," Monograph No. 7, (Washington, D. C.: George Washington University, 1970), pp. 3-4.

[17] Black, "On the Cost of Engineering Education," p. 11-17.

decision to formulate the Four Year Budget projection on a program basis with income and expenses delineated is a quantum jump in the right direction. Perhaps the most pressing additional need is for quantifying the present and future objectives of existing programs and insuring that they compliment and are in accord with those of the university. The "in house" fiscal and analytical expertise is available, but dissemination of this knowledge to the department heads and a formalized planning cycle must be implemented. The University is firmly committed to a decentralized form of administration, and the planning function should also be decentralized but with adequate high level leadership and guidance. The emphasis must be shifted to the department chairman's estimate of what type and level of program he plans to offer, at what cost, and with what expected income or enrollment. By delegating the planning function to a specific body with a competent staff, a computerized model of the University could be developed producing definite savings by virtue of the improved data available to decision-makers on all levels. The problem of quantifying the benefit side of the coin for use in cost-benefit analyses is not viewed as critical, and the present practice of utilizing an income substitute in conjunction with a system of qualitative criteria will serve as an interim measure. It is recognized that these relatively few steps involve some bold and innovation action on the part of the University administration, but with the end in sight, it would seem criminal to stop short.

The control function at George Washington is embodied in the department heads to a limited extent and centered in the Controllor under the Financial Vice President and Treasurer. Although control has been adequate in that salaries and bills have been paid promptly, the fine tuning information has often not been available to managers until after the fact. The

various departments have been established as cost centers and receive a monthly comparison of their direct expenses and budgeted expenses as well as funds remaining in their respective accounts. This has in effect limited the discretionary control of the department heads to actions such as transfering money from the Office Supplies account to the Office Equipment account in order to purchase a new typewriter. The accuracy of financial information is very good partially because of the established nature of the system. Collection is done centrally by the controllor and distributed by him to the departments. The new problem of allocating a student's tuition or portion thereof to different programs has already raised some accounting headaches, but is simplified by the near coincidence of program definition with the department. Plant and equipment records are similarly accurate as the result of several indepth surveys, but are not updated except as a result of irregular inventories or studies. The most troublesome files involve faculty and student records which suffer from haphazard updating and lack of communication between different departments of the University.

The classification and definitions of Income and Expense accounts is presently in conformity with those proposed by the American Council on Education in the handbook of College and University Business Administration. The University's auditors, Price Waterhouse and Company have been working with the university on a consulting basis to develop a more comprehensive chart of accounts which would be capable of integration into a centralized information system. The designation of program classification, program elements, and subelements has begun and is being constructed along the guidelines developed by WICHE and the Higher Education Government Information System (HEGIS) both of which are still in the development stages.[18] Development and design of

---

[18] Johnson interview.

an integrated base is hindered again by the presence of "vested interests"--different factions or departments guarding their own files, computer hardware limitations, and the lack of a common data element or identifier for all types of information. Separate files are maintained and updated at intervals varying from once a year to monthly. There is considerable duplication between departmental and university files and the problem of integrating faculty/student information with course, financial, and plant information is enormous.

Accuracy of the information and indices that are utilized by the Controllor's Office is viewed as good, due partially to the established nature of the centralized collection (and useage) system, and partially because of the generally rudimentary indices being used. Almost all the information gathered and manipulated is from the cost or expense side of the equation. Costs per semester hour, salary costs per credit hour, space per student or even direct costs per student by major field and differentiated by academic level have been until the recent introduction of Indirect Expense accounting assignment accomplished primarily by dividing the department's budget by the number of students, etc., assigned.[19] The present introduction of a full costing concept with regard to individual programs and the use of transfer prices between departments is indicative of the rising level of sophistication of this function. The totally integrated information systems promoted and advocated by theorists is viewed as a "pie in the sky" goal with the university tending toward the more realistic approach of setting up different subsystems with some degree of interface, "if only they can find the funds somewhere" to install even this method.[20] The recommendations of Price Waterhouse have been

---

[19] "Fee Increases (1970-71) Projection", (unpublished), Washington, D. C. George Washington University, pp. 1-2.

[20] Johnson interview.

oriented along these more pragmatic lines. Another encouraging sign is the increased usage of the Data Processing Center for development of specialized reports and the incorporation of programming and systems design talents in the Controllor's staff. The capability of the control systems to keep pace with the information demanded by the planning and decision elements is viewed as excellent. In fact they may even be in the position of providing information that the decision-makers didn't know that they needed. However, lags and indecision on the part of top officials as well as the natural trepidation to abandon the familiar status quo for a unknown and seemingly more complicated and expensive system pervades most discussions of the future.

In total then, how well is the George Washington University meeting the money crunch by adapting and adopting the available technology and methods to its experience? Progress in most areas, with the exceptions noted, has been good, but the tendency to hang back and hide in the shadow of more studies, committees, and theoretical modeling rather than actual introduction and implementation is evident. This philosophy of developing all facets of the ideal system before committing the considerable resources required has its merits. However, the possibility of realizing short range savings may be neglected or lost. The analogy of the patient who bled to death as the surgeons were assembling and designing the ultimate equipment for his treatment is worth noting. Presently the responsibility for the design of any system of financial management rests with a few top level managers. There is no vehicle or process for the department heads' participation or inputs in the establishment of these systems. Personal involvement and, by extension, a greater degree of committment could be fostered by formally legitimizing the planning process and demanding participation by all managers in an effort to coordinate academic interests with financial interests. The training and/or exposure of the

departmental heads would reap large dividends by virtue of their increased capability to accept responsibility and contribute positively to the planning and control process.

CHAPTER V

CONCLUSIONS AND SUMMARY

Implications and Areas for Further Study

The most obviously deficient area of immediate concern to the educational practitioner is the quantification of the social benefits or products of the university. As previously noted, only the surface of the problem has even been touched. Most of the cited institutions have resigned themselves to the acceptance of a surrogate or proxy measure of their outputs. The real value of the program budgeting process lies in the opportunity to examine all the ramifications of alternative courses of action. Inherent in this comparison are good measures of total benefits and total costs. In the latter case the possibility of including the opportunity or foregone income costs should be explored as another step toward full costing. The inclusion of some judgement of quality or common index of educational value in the development of a benefit measure is viewed as unfortunately unavoidable. In keeping pace with the latest quantitative methods, the incorporation of stochastic modeling techniques would also seem to merit attention. Until some truly descriptive benefit measure, at least on an inter-university level, is developed, any cost-benefit analyses will remain flawed to some degree.

Another aspect of the planning and control function of university operations is the problem of widespread acceptance and implementation. This paper has demonstrated that there is an ample store of knowledge and practical experience available in the experience of business, government, and educational

finance. However, the difficulty of dissemination and development of general expertise in the application of a sound system on an operational level has lessened their value and effect. Despite the recent realization on the part of most college and university administrators that they must be hard-nosed businessmen in the management of their institutions, there is little or no coordination and cooperation among educators on these subjects. The enlightened few publish papers, and even implement sound techniques, but the good news often is unknown, or possibly ignored by the majority. A study of the feasibility of setting up a national clearinghouse to coordinate all research and experimentation as well as widely distribute the results is imperative, although he may admittedly be somewhat biased, H. Ross Perot, in speaking to the Central Association of College and University Business Officers, proposed a pilot study by as few as ten universities, in order to minimize the monumental costs involved in construction of comprehensive computer models and information systems.

This suggestion to avoid any diffusion of effort is well taken. The WICHE-type operation is a regional model for cooperation and pooling of assets. The George Washington University, by virtue of its close proximity to the other universities in the consortium would seem ideally placed for a similar cooperative venture in the development of systems which would be prohibitive for a single university. The possibility of consolidating this type of program under the aegis of the federal government is not viewed as valuable as supervision by a national education association because of the problem of infringing on the operation of private universities. Nevertheless, the subsidation of these pilot projects of a national model system is not without merit since this might contribute to more efficient use of the increasing volume of grants to education, public and private. The long range benefits

of providing for this increased effectiveness would appear analogous to repairing the bucket before pouring large quantities of water into it.

Conclusions and Summary

> For two full decades, culminating in the late 1960's, United States colleges and universities lived a privileged, patrician existence. The Federal government and private foundations heaped upon them millions of dollars for all manner of experimental programs, state legislatures unhesitatingly appropriated the funds necessary to teach unprecedented numbers of students, and alumni regularly broke all records for contributions. But now, with alarming suddenness, the nation's institutions of higher learning--from the most prestigious universities to the most obscure junior colleges--find their once secure financial structures in near shambles--and their future financial prospects grimmer yet.[1]

For one thing, the "unprecedented numbers" of students has not given rise to what may have been considered a logical extension; that these figures plus geometric population projections imply *ipso facto* an unlimited demand for education. Further, the assumption that the demand is infinite and the only real problem facing colleges and universities is expanding and reaping the benefits of increasing economies of scale has proven fallacious. Despite Professor Black's conceptual model of demand as a function of tuition levels, other factors must be considered. The proposed elimination of, or at least the present "single jeopardy" approach to, the draft may have an effect on enrollment. The wave of student discontent with established institutions and conventional patterns is similarly indicative of a possible altering of the present structure of higher education. The meteoric rise of Junior colleges has completely revised the mix of educational institutions. When all these factors are considered in conjunction with prevailing national economic conditions, the diminished demand for conventional education can be understood. The hardest hit by this lessened demand have been the private

---

[1] *Newsweek*, "Recession Hits The Colleges," March 22, 1971, p. 63.

colleges and universities. Yale University has recently reported a decline in applications of two thousand or nearly twenty percent. The George Washington University estimates the loss of nearly one million dollars in tuition income for 1972 because of decreased enrollment projections. The dean of admissions attributed this drop to "the economic conditions of the country and its discouraging effect on the ability of families to send their children to private schools."[2] Is this really the whole story and if so, why? The economic realities of the recession and the skyrocketing costs are well known, and not the focus of this paper. The direct recessionary effect on endowment income has also been indirectly reflected in alumni gifts. In a similar vein, the assumption that the burgeoning school-age population would provide an infinite demand for the services of colleges and universities has proven faulty. An increasing percentage of this new volume of "raw material" is incapable of shouldering even what has generally been accepted as only a partial contribution to defraying the costs of their education. In Federal and State budgets, education has taken a back seat to defense, welfare, and ecology interests.

Granted, all these considerations have hurt our institutions of higher learning, but by far the most pervasive problem has been antiquated or non-existent planning and control systems.

> Under normal business practice, universities would be expected to allocate funds to each department. In fact, what often happened was that departments simply asked for what they wanted, and the university set about finding the money.[3]

The general state of the national economy with its rising prices, and salaries are not within the province of the educational administrator's control.

---

[2] Washington Post, April 19, 1971, p. 424.

[3] Newsweek (March 22, 1971), "Recession Hits The Colleges".

However, the responsibility for effective and efficient management systems is. The case of The George Washington University is particularly illustrative in that because of the primacy of tuition income, the planning and control of funds tends to dominate all other considerations.

The methodology of focusing on the planning and control aspects of current operations is only one possible answer to the problem of educational deficits. Alternative approaches would involve increasing revenues either by increasing tuition (and student's ability to pay) such as the "deferred tuition" option recently suggested by Yale's Kingman Brewster, or by increasing direct Federal grants to institutions which always carries with it the problem of how much control the government may exercise over the recipient's use of the funds.[4] Within the university itself endowment fund management, increased alumni fund campaigns, and capital financing provide similar opportunities for refloating the sinking college and university fiscal structure. At this point it would seem beneficial to reexamine some of the basic questions in the area of current operations.

What are some of the concepts and techniques currently being utilized by corporate and governmental financial managers in planning and control of current operations?

How have these techniques and concepts been assimilated and adapted to the theory and practice of educational financial administrations?

Is the sum total of the academic, business, and public administration experience regarding planning and control applicable to, or actually being implemented by, The George Washington University?

---

[4] The deferred tuition plan was recently adopted by Yale University under the sponsorship of the Ford Foundation. Under this system a student may elect to borrow his tuition from the college or university, and repay it in his earning years based on a percentage of his post-academic earnings.

In the foregoing chapters dealing with exemplary types of business systems, entire techniques were viewed as not only applicable, but actually being incorporated by some small, but innovative number of universities. The long and short range planning concepts including costed pro forma budgets, a uniform system of accounting, and fairly sophisticated budgeting formulae have gained increasing popularity particularly in state universities where appropriation requests must be minutely and rigorously justified.[5] The almost universal problem of most institutions was a failure to firmly quantify their goals in measureable terms. Any development of classification systems, budgets, and management information systems must be firmly anchored to concrete objectives. The classical allusion to the tower built on sand should serve as a warning to systems which have evolved without regard to sound foundations.

The field of government and public administration has contributed materially to educational planning and control systems by virtue of its program budgeting concept and the allied cost-benefit type analysis techniques. Whole hearted acceptance of the theoretical superiority of this format appears almost universal. Unfortunately, practical or actual implementation is lagging badly. The basic research has, for all intents and purposes, been done and the concepts proven. What remains is for the university administrators to take these frameworks and mold them to their particular situations. The order of this process is important in that the models should be adapted to the university not the university to the model. This process is, again, not a simple one, and carries with it serious long range implications for the organizational structure and management philosophies in general.

---

[5] James Miller, State Budgeting for Higher Education: The Use of Formulas and Cost Analyses, (Ann Arbor: University of Michigan, 1964). The author details the techniques practiced by some ten state universities in one budgeting process.

The practical application of these previously developed theories and practices in the context of The George Washington University illustrated several things. The administration's latest reaction or response to the general depression in education, aggravated by a forecast decline in undergraduate enrollment next year, is indicative of the better of two alternatives. One possible approach, provided of course, that the prospective enrollment decrease and consequential decrease in expected revenues had even been recognized prior to its becoming a fait accomplis, would have been to order an across the board reduction in every facet of the university. Fortunately George Washington has not done this; instead they have seized the opportunity to make an intensive study of "where they are now" and "where they are headed."

The university has benefitted from the practical and theoretical experience of business, government and education by extracting from these areas those methods applicable to their own experience. They have undertaken a reasonably coordinated examination of which areas/departments contribute more or less to the total university in terms of tuition income less total expenses. This study of just how much each program earns in tuition attracted versus its actual costs is not presented as the single criteria of worth, but is being utilized as a planning tool for examining some of the more basic premises and policies of the university. A long range faculty staffing study is raising such questions as whether the use of highly paid professors in some teaching situations is more beneficial than using instructors in these same positions. The relative merit or value of part-time faculty and the "off campus" program versus their incremental costs and revenues is similarly being weighed. This is not to say that George Washington stands as a flawless example of sound financial management. The absence of a formalized planning, analysis or research body; a quantification of the university's and the

individual department's or program's objectives; and some measurement of the benefits or outputs of the various programs has already been mentioned as definite failings. The latter deficiency has been somewhat mitigated by the substitution of a revenue function with ample recognition that this is not a true cost-benefit relationship, but a cost-revenue analysis. The fact that Mr. Brewster has said "it is dangerous to run a qualitative efficiency study on higher education" lends some credence to this suboptimal measure. Perhaps, the most salient feature of the George Washington situation is that knowledgeable, competent, and dedicated administrators are attacking the right problems with the right tools, albeit with very deliberate speed.

All three of the research questions really focus on the question of the universality of financial management. This "universality" does hold true with regard to the field of educational finance to the same extent as in business or government. The basic principles, functions, and techniques are immutable and can produce excellent results when applied judiciously. It is this adaption or application process which causes the most difficulty. The exact formulas, computations, or programs that have been proven useful by one university, business or agency are not one hundred percent transferable to every other situation, but the general systems, models, and techniques are valid regardless of the particular application or orientations.

BIBLIOGRAPHY

Books

Anthony, R. N. *Management Accounting*. Homewood, Illinois: Richard Irwin, Inc., 1964.

Axt, R. G. and Sprague, H. T. (ed.) *College Self Study, Lectures on Institutional Research*. Boulder, Colorado: Western Interstate Commission for Higher Education, 1959.

Barzun, J. *The American University*. New York: Harper and Row, 1968.

Bonini, C. P. *Simulation of Information and Decision Systems in The Firm*. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1963.

Blackwell, T. E. *College and University Administration*. New York: The Center for Applied Research in Education, 1966.

Bowen, H. R. *Finance of Higher Education*. Berkley, California: The The Carnegie Commission, 1968.

Bowen, W. G. *The Federal Government and Princeton University*. Princeton, New Jersey: Princeton University Press, 1962.

Bowman, E. H. and Fetter, R. B. *Analysis for Production Management*. Homewood, Illinois: Irwin, Inc., 1961.

Cheit, M. *A New Depression in Higher Education*. New York: McGraw Hill, 1970.

Dorfman, R. *Measuring Benefits of Government Investments*, Washington, D. C.: The Brookings Institute, 1965.

Dressell, P. E. *Evaluation in Higher Education*. Boston: Houghton Mifflin, 1961.

Fayol, H. *General and Industrial Management*. New York: Pitman Publishers, 1949.

Flaks, M. and White, G. L. *Introduction to PERT/CPM.* New York: Booz, Allen, and Hamilton, 1967.

Gerwin, D. *Budgeting Public Funds: The Decision Process in an Urban School District*. Madison, Wisconsin: University of Wisconsin Press, 1969.

Harris, S. E. *More Resources for Higher Education*. New York: Harper and Row, 1960.

________. *Higher Education: Resources and Finance*. New York: McGraw Hill, 1962.

Henderson, A. *Policies and Practices in Higher Education*. New York: Harper and Row Brothers, 1960.

Hungate, T. L. *Management in Higher Education*. New York: Columbia University Press, 1964.

James, H. T.; Kelly, J. A.; and Garms, W. I. *Determinents of Educational Expenditures in Large Cities of the United States*. Stanford, California: Stanford University, 1960.

Kayser, E. L. *Bricks Without Straw*. New York: Appleton-Century-Crofts, 1970.

Keezer, D. *Financing Higher Education*: 1960-70. New York: McGraw-Hill, 1959.

Kershaw, J. and McKean, R. N. *Systems Analysis and Education*. Santa Monica, California: The Rand Corporation, 1959.

Koontz, H. and O'Donnell, C. *Principles of Management*, New York: McGraw Hill, 1968.

Lincoln, J. F. *Intelligent Selfishness and Manufacturing.* New York: Lincoln Electric Company Bulletin No. 434 (undated).

McKean, R. N. *Public Spending.* New York: McGraw-Hill, 1968.

Ruml, B. *Memo to a College Trustee*. New York: McGraw-Hill, 1959.

Smykay, E. W. (ed.). *Essays on Physical Distribution Management*. Washington D. C.: Traffic Service Corporation, 1961.

Stecklein, J. E. *How to Measure Faculty Workload*. Washington, D. C.: American Council on Education, 1962.

Tickton, S. *Needed: A Ten Year College Budget*. New York: The Fund for the Advancement of Education, 1961.

Williams, H. *Planning for Effective Resource Allocation*. Washington, D. C.: American Council on Education, 1966.

Woodruff, A. M. and Alexander, T. G. *Success and Failure in Small Manufacturing*. Pittsburg: University of Pittsburg Press, 1958.

Reports

Black, G. *On The Cost of Engineering Education*. Washington, D. C.: George Washington University, 1970, Monograph No. 7.

California Department of Education. *The Faculty Staffing Formula of California State Colleges*. Sacramento, California: Department of Education, 1957, mimeograph.

Firman, J. *University Cost Structure and Behavior*. Washington, D. C.: National Science Foundation, 1967, Contract number C-451.

Henle, R. J. *Systems for Measuring and Reporting the Resources and Activities of Colleges and Universities*. Washington, D. C.: National Science Foundation, 1967.

Herzog, H. *1970 Report of the Treasurer*. Washington, D. C.: George Washington University, 1970.

Hitch, C. and Balderston, F. E. *Report of a Program of Research in University Administration*. Berkley, California: University of California, 1969, research report number 69-13.

Keller, J. *Higher Education Objective and Measuring of Performance and Efficiency*. Berkley, California: University of California, 1969, unpublished draft.

Koenig, H. E.; Keeney, M. G.; and Zemack, R. *A Systems Model for Management, Planning, and Resource Allocation in Institutions of Higher Learning*. Washington, D. C.: National Science Foundation, 1968, contract number C-518.

Martin, I. C. *The Woodward Way.* Rockford, Illinois: Woodward Governor Company, 1969.

U. S. Department of Health, Education, and Welfare. *Digest of Educational Statistics, 1969*. Washington, D. C.: U. S. Government Printing Office, 1969.

University of California. *A Program Budget FY 1970-71--FY 1973-74*. Berkley, California: University of California, 1969, mimeograph.

Articles

Anshen, M. "The Federal Budget as an Instrument for Management and Analysis." *Program Budgeting: Program Analysis and the Federal Budget*, edited by David Novick. Cambridge, Massachusetts: Harvard University Press, 1965, p. 3-23.

Brewer, S. H. and Rosensweig, J. "Rhochrematics and Organizational Adjustments." *California Management Review*, Spring, 1961.

Dale, E. and Karni, M. "Long Range Planning." *Readings in Management* edited by Ernest Dale. New York: McGraw-Hill, 1965.

Daniel, D. R. "Management Information Crisis." *Harvard Business Review*, September-October, 1961, p. 116.

Donaho, J. "Performance Budgeting and Higher Education." *Quality and Opportunity in Higher Education*. Boulder, Colorado: Western Interstate Commission for Higher Education, 1959, pp. 81-85

Furtado, L. M. and Courey, C. J. "Fiscal Planning: Financial Guide to Decision-Making." *College and University Business*, August, 1965, pp. 39-43.

Graese, C. E. "University Management: A Total Preview." *Management Controls*, April, 1968, pp. 75-76.

Hammond, R. A. "Making Operations Research Effective for Management." *Business Horizons*. Spring, 1962, p. 76.

Held, V. "PPBS Comes to Washington." *The Public Interest*. Summer, 1966, pp. 105-116.

Hermann, C. C. and Magee, J. F. "Operations Research for Management." *Harvard Business Review*. July-August, 1953, p. 106.

Hicks, J. W. "Making the Best of Limited Resources." *College and University Business*. December, 1957, pp. 41-47.

Jenny, H. "Putting the Ten Year Budget in Practice." *College and University Business*. February, 1965, pp. 35-40.

Kline, C. A. and Hessler, H. C. "The Dupont Chart System for Appraising Operating Performance." *Financial Decision Making*, edited by Edward Mock. Scranton, Pennsylvania: International Textbook Company, 1967.

Nee, J. F. "The Essential Nature of Objectives." *Management* edited by Harold Koontz and Cyril O'Donnell. New York: McGraw-Hill, 1964.

Newsweek. "Recessions Hit the Colleges." March 22, 1971, p. 63.

Packard, D. "Assuring the Company's Future." *American Management Series, number 175*. New York: American Management Association, 1955.

Rourke, F. E. and Brooks, G. E. "The Managerial Revolution in Higher Education." *Administrative Science Quarterly*. September, 1964, pp. 154-181.

Saunders, P. "Management Information Systems." *Systems and Procedures* edited by V. Cozzaro. Englewood Cliffs, New Jersey: Prentice Hall, 1968.

Sherwin, D. "The Meaning of Control." *Dun's Review and Modern Industry*. January, 1956, p. 45.

Smithies, A. "Conceptual Framework for the Program Budget." *Program Budgeting: Program Analysis and the Federal Budget edited by* David Novick. Cambridge, Massachusetts: Harvard University Press, 1965.

Tomb, J. "A New Way to Manage: Integrated Planning and Control." California Management Review, Fall, 1962, p. 57.

Interviews

________. Personal Interview with William Johnson, Budget Officer, The George Washington University, Washington, D. C., March 19, 1971.

________. Personal Interview with Dr. Harry Page, Dean of the Department of Administration, The George Washington University, Washington, D. C., April 29, 1971.

3 AUG 76
14 AUG 79
10 JUN 80

22083
23986
25774
26901

Thesis 127886
S3752 Schwartz
Planning and control systems in the current operations of institutions of higher education.

DISPLAY
~~6 JAN 77~~
7 AUG 74
3 MAY 76
14 AUG 79

21624
22083
~~23986~~
25774

Thesis
S3752 Schwartz
Planning and control systems in the current operations of institutions of higher education.
127886

thesS3752
Planning and control systems in the curr
3 2768 001 94337 6
DUDLEY KNOX LIBRARY